

Zerorez[®] Clutch Drive System 4.8[™] Chevy Owner's Manual

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1 - General Information

The Zerorez Clutch Drive System (CDS) 4.8 Truckmounts are custom-engineered carpet cleaning machines developed, designed and manufactured by HydraMaster for Zerorez. The systems utilize the most current technology available in water heating and water recovery systems.

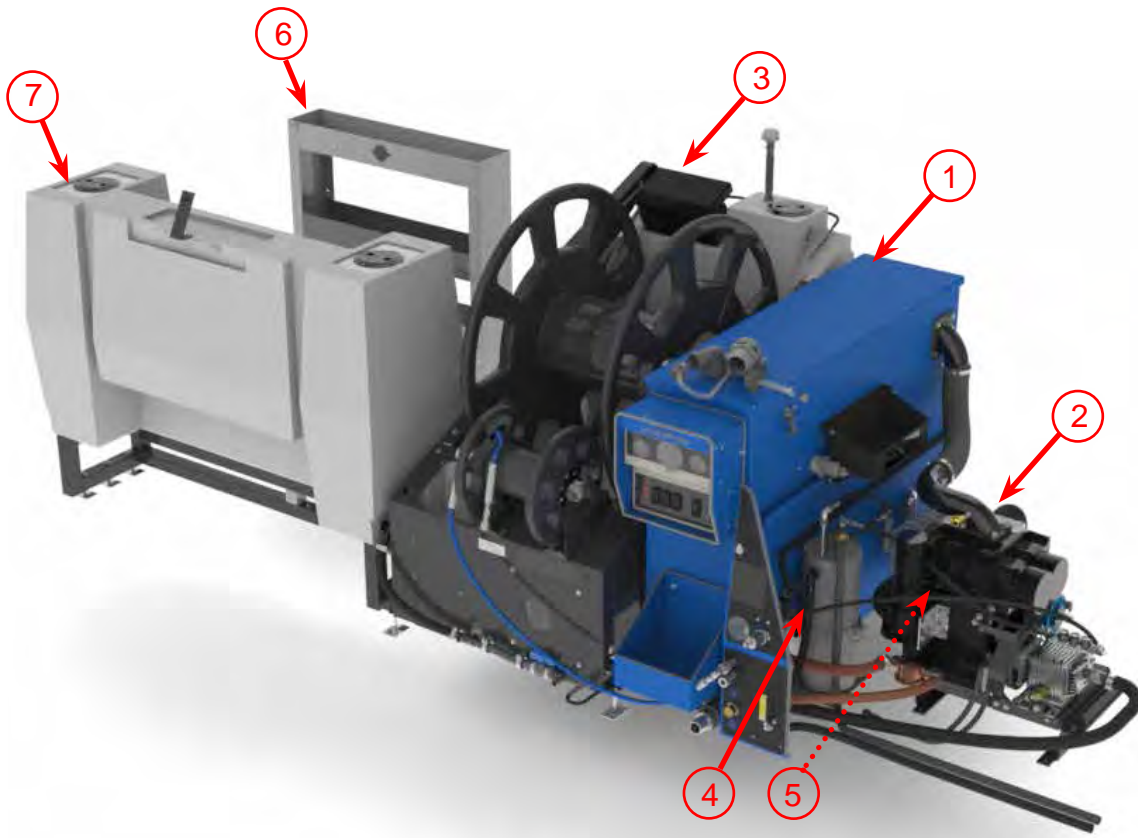


Figure 1-1. Zerorez CDS 4.8

The Zerorez CDS 4.8 equipment, shown in Figure 1-1, is shipped as a kit from HydraMaster to distributors, and includes the following major components. (See page 8-2 in this Owner's Manual for more information.)

1. Zerorez CDS 4.8 Tank Assembly, which includes the instrumentation panel
2. Zerorez CDS 4.8 Power Pack Assembly
3. Additional 125 Gallon Fresh Water Tank with integrated multi-reel system, specially designed to fit Zerorez' specifications
4. Coolant Heat Exchanger Assembly
5. Salsa Heat Exchanger
6. Three Tier Stainless Steel Shelf
7. 110 Gallon Fresh Water Tank - shipped separately.

As there is no guesswork in the manufacture of these highly advanced cleaning systems, there must be none in preparing the Zerorez CDS 4.8 to get the job done in the field. It is the purpose of this manual to help you properly understand, maintain and service your cleaning plant. Follow the directions carefully and you will be rewarded with years of profitable, trouble-free operation.

This Owner's Manual contains operation instructions as well as information required for proper maintenance, adjustment and repair of the Zerorez CDS 4.8. Component troubleshooting guides have also been included for your convenience.

It is imperative that no section be overlooked when preparing for operation of this equipment. Please read this Owner's Manual to familiarize yourself with the operation of the Zerorez CDS 4.8, paying special attention to all **Warnings and Cautions**.

This section of the manual contains the following helpful information:

- Contact Information
- Warnings, Cautions and Notices
- Machine Specifications
- Responsibilities
- Waste Water Disposal Advisory

CONTACT INFORMATION

If you have any questions regarding the operation, maintenance or repair of this machine, please contact your local distributor.

WARNINGS, CAUTIONS AND NOTICES

WARNING

HydraMaster uses this WARNING symbol throughout the manual to warn of possible injury or death.

CAUTION

This CAUTION symbol is used to warn of possible equipment damage.

NOTICE

This NOTICE symbol indicates that federal or state regulatory laws may apply, and also emphasizes supplemental information.

Warnings and Cautions specific to the Zerorez CDS 4.8 include:

⚠ WARNING

HOT SURFACES: During the operation of this equipment, many surfaces on the machine will become very hot. When near the van for any reason, be careful not to touch any hot surface, such as the engine or the exhaust.

⚠ WARNING

HEARING PROTECTION: The Occupational Safety and Health Administration (OSHA) recommends the use of hearing protection when a technician is exposed to an average of 85 decibels (this is an average of exposure over an eight-hour period). This equipment can produce 85 decibels to a distance of 10 feet. Please check with your local state agencies to see if OSHA standards apply to your application.

⚠ WARNING

NO SMOKING: It is unsafe to smoke in or around the vehicle. Do not allow any open flames in or around the vehicle.

⚠ WARNING

CARBON MONOXIDE: This unit generates toxic fumes. Position the vehicle so that the fumes will be directed away from the job site. Do not park where exhaust fumes can enter a building through open doors, windows, air conditioning units or kitchen fans.

⚠ WARNING

TOXIC FUMES: Do not occupy the vehicle when the cleaning equipment is operating. Toxic fumes may accumulate inside a stationary vehicle.

⚠ WARNING

ENGINE EXHAUST: The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

⚠ WARNING

MOVING PARTS: Never touch any part of the machine that is in motion. Severe bodily injury may result.

CAUTION

THROUGH-FLOOR DRILLING: Be cautious when drilling holes through the van floor. Many vans have critical components mounted directly below the van floor that could be damaged by a misplaced drill bit.

CAUTION

LEVEL OPERATION: During operation, the vehicle must be parked on level ground not to exceed + or - 10 degrees. Failure to ensure proper leveling may prevent proper internal lubrication of engine, vacuum and/or high pressure components.

CAUTION

FREEZE PROTECTION: Failure to take appropriate measures to prevent equipment damage due to freezing can result in system failure and loss of warranty on affected parts. Placing an electric heater in the vehicle or parking the vehicle indoors will help ensure against freezing, but should not be the primary method of freeze protection.

MACHINE SPECIFICATIONS

CDS 4.8 Cleaning Unit (including blower and heat exchangers)

Frame	41.5" H x 61.0" L x 23" W	
Weight	900 lbs.	
Construction	Tank	Marine Aluminum with Baked-on Epoxy Finish
Chassis	Powder Coated Steel	
Cowling	Fiberglass	
Power Transfer	Electric Clutch-driven Shaft, Key Activated	
Drive Type	Universal Drive Shaft	
Drive System	PolyChain on PowerPack	
Vacuum Blower	4007 Tri-Lobe; Dual Oil Bath; Tuthill Dominator	
	Blower rpm @ 14"Hg 3,000	
Heating System	Engine Coolant Heat Exchanger (1,200 psi)	
	Blower Exhaust (Salsa) Heat Exchanger (1,200 psi)	

Instruments		
	Main Panel	
		Electronic Tachometer, 0-3,000 rpm
		Water Temperature Gauge, 0-320 Degrees F
		Vacuum Gauge, 0-30" Hg
		Hour Meter, Machine Run-Time
		Keyed Ignition, Start/Stop
		Electronic Circuit Protection Breaker, Resettable
		Machine Status Indicator Lamps
		Water Pressure Gauge, Liquid Filled, 0-1,500 psi
		Dual Tool/Wand Hook-up
	Side Panel	
		Water Pressure Adjustment
		Blower Lubrication Port
		Water Temperature Adjustment Knob
		High Pressure Outlets

High Pressure Hose	1/4" High Temperature, Lined, Vinyl Covered
	Hose rated to 2,200 psi, 250 Degrees F
Standard Equipment	Power Transfer Package
	Component Power Pack
	Equipment Cowling
	Control Console
	HydraMaster Heat Exchanger System
	Wheel Chock Set
	Van Decal Package
	Recovery Tank MaxAirTank (Aluminum) 100 gallon Capacity
	Two Back Door Bins for Extra Storage
	Automatic Pump-Out (Dura Flow APO)
	Freeze Guard System
	Pass Through Kit
	Carpet Tool/Wands
	10', 1 1/2" Drain Line
	Cleaning Tool/ Wand - One 2" Evolution Stainless Steel Wand and One Pressure Wash Tool
	Van Finish Package
	Owner's Manual (on CD)
	Owner's Manual (paper)

HydraCradle Fresh Water Tank

Tank Capacity	125 gallons	
Tank Construction	Rotomolded LLDPE *	
Mounting Components	Powder coated steel	
Dimensions	47¼" H x 65" L x 34" W	
Weight (without Vacuum Hose)	285 lbs	
38" Diameter Vacuum Hose Reel - Standard - (for 2" Diameter Hose)	Maximum Capacity	250 ft.
	Construction	Rotomolded LLDPE*
	Electrical Operation	Power Retraction - Standard
Blue Vacuum Hose	5 sections x 50 ft; 2" Diameter	
14" Diameter Solution Hose Reel *	Maximum Capacity	250 ft.
	Construction	Rotomolded LLDPE
Blue Solution Hose	250 ft, ¼" Diameter	
Hose Reel Motor Fuse	30 Amp	

110 Gallon Fresh Water Tank

Tank Capacity	110 gallons
Tank Construction	Polyethylene, Ultra Thick Wall
Dimensions	34" H x 60" L x 18" W
Weight	150 lbs.

* LLDPE = Linear Low Density Polyethylene

RESPONSIBILITIES

Sales Representative's Responsibility

Acceptance of Shipment

Before accepting the truckmount, check the following:

1. The truckmount should be free from any damage during shipping. Do not sign the delivery receipt until you have closely inspected the truckmount and noted any damage on the delivery receipt. Hidden damage may be present even if the box looks fine. It is recommended that the box be opened before you sign for the shipment.
2. Check the packing list and verify that all items are present.

Installation Responsibilities

- Ensure proper payload capability. The Zerorez CDS 4.8 must be installed into a vehicle with a payload capacity of 3,850 lbs or greater.
- Ensure proper placement of the CDS 4.8, fresh water tanks, and accessories in the vehicle, and check that they are secured with bolts and back up plates. The distributor should verify that the owner is in agreement with the layout.
- Ensure proper installation of the electrical wiring and the connections to the vehicle's battery.
- Check the pump, vacuum blower and engine oil levels prior to starting the truckmount.
- Start and run the truckmount and check that all systems function properly.
- Test all hoses, wands and other accessories for correct operation.
- Ensure timely return of the document package.

Training

- A thorough review of the Owner's Manual with the purchaser.
- Instruction in and familiarization with:
 1. How to correctly start up and shut down the unit
 2. How to correctly clean with the unit
 3. Where and how often to check and change component oil levels
 4. How the unit's systems work, how to troubleshoot the unit
 5. How to do basic repairs
 6. Safety precautions and their importance
 7. How to avoid freezing damage
 8. How to avoid hard water damage
 9. A thorough review of the unit warranty and warranty procedures.

Purchaser's Responsibility

If you are the purchaser, it is your responsibility to read the Owner's Manual and to familiarize yourself with the information contained herein, paying special attention to all Warnings and Cautions.

WASTE WATER DISPOSAL ADVISORY

There are laws in most communities prohibiting the dumping of recovered “gray” water from carpet cleaning in any place but a sanitary treatment system.

The cleaning rinse water, recovered into your unit’s vacuum tank, contains materials that must be safely processed before entering streams, rivers and reservoirs.

In most cases, an acceptable method of waste water disposal is to discharge into a municipal sewage treatment system after first filtering out solid material such as carpet fiber. Access to the sanitary system can be obtained through a toilet, laundry drain, RV dump, etc. Permission should first be obtained from any concerned party or agency.

One disposal method is to use the Automatic Pump-Out System (APO). This system, available with the Zerorez CDS 4.8 package, is designed to remove waste water from the extractor’s recovery system and actively pump the water through hoses to a suitable disposal drain.

When properly configured, the APO will continuously monitor the level of waste water and pump it out simultaneously with the cleaning operation. The hidden benefit of this process is that the technician does not have to stop his/her cleaning to empty the recovery tank.

NOTICE

IN ACCORDANCE WITH EPA, STATE AND LOCAL LAWS, DO NOT DISPOSE OF WASTE WATER INTO GUTTERS, STORM DRAINS, STREAMS, RESERVOIRS, ETC.

The penalties for non-compliance can be serious. Always check local laws and regulations to be sure you are in compliance.

2 - Operating Instructions

This section of the manual contains the following instructions:

- Before Operating the Zerorez CDS
- Zerorez CDS Start Up
- Throttle Control Function
- Zerorez CDS Shut Down
- HydraCradle Tank Daily Shut Down
- HydraCradle Tank Shut Down for Extended Storage

CAUTION

When operating the HydraCradle Tank during the colder months of the year, ensure that you properly freeze guard the system. Failure to take appropriate measures to prevent equipment damage due to freezing can result in system failure and loss of warranty on affected parts.

BEFORE OPERATING THE ZEROREZ CDS

1. Locate the unit and equipment in a well-ventilated area.

▲ WARNING

The Zerorez CDS unit generates toxic fumes. Position the vehicle so that the fumes will be directed away from the job site. Do not park where exhaust fumes can enter a building through open doors, windows, air conditioning units or kitchen fans.

2. Check the fuel tank to be certain there is adequate fuel to complete the job.
3. Position the wheel chocks on one of the front tires.
4. Connect all required hoses (see page 8-66) for hose routings list).
5. When connecting the pressure hose to the pressure outlet connections at the front of the unit, go to the farthest area to be cleaned and connect to the cleaning tool. This ensures that you have the proper length of hose required to perform the cleaning.

ZEROREZ CDS START UP

1. Make sure the vehicle's gear select lever is in the Park position and the emergency brake is set.
2. Start the vehicle's engine.
3. Manually unwind the vacuum hose a few feet off of the HydraCradle Tank's vacuum reel, and press on the foot switch to test for power retraction of the hose.
4. Power up the CDS by turning the key in the ignition switch (see Figure 2-1).
5. Select the cleaning speed appropriate for the cleaning job.
6. Turn on the PUMP CLUTCH switch. Adjust cleaning pressure to desired level.

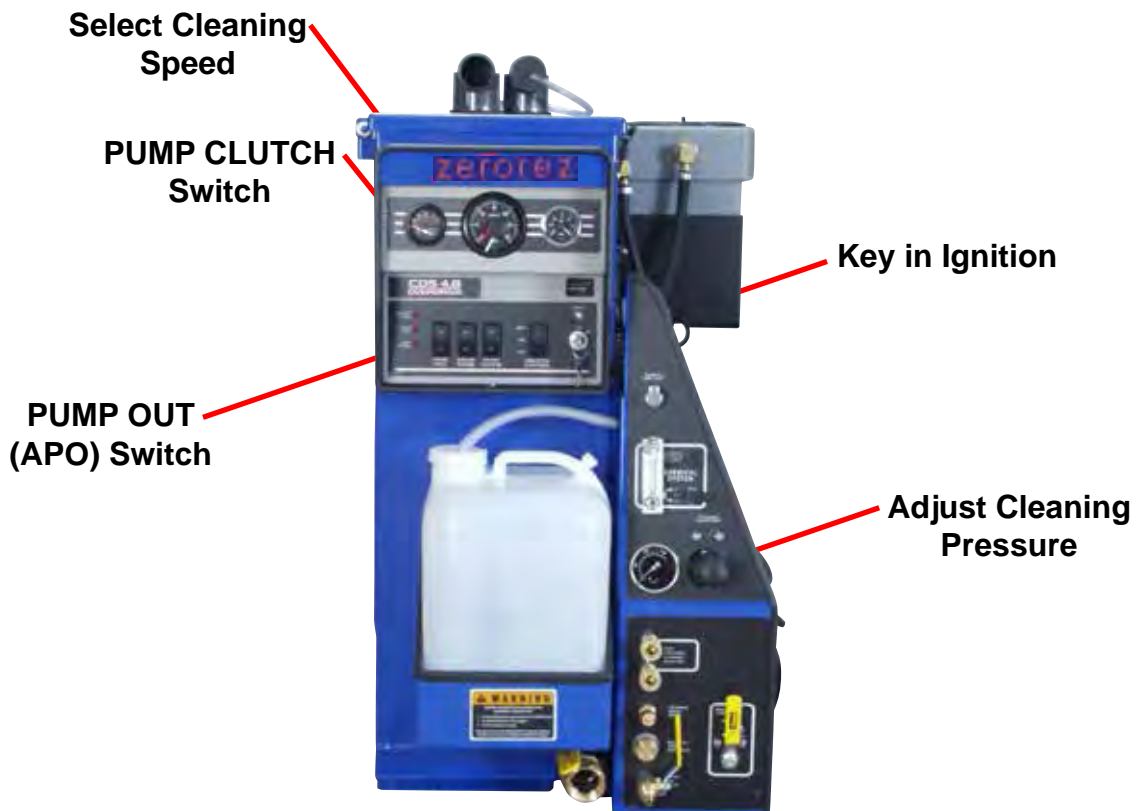


Figure 2-1. Front View of Zerorez CDS

7. Connect the APO to a dump hose (the length of a garden hose), route the hose to an appropriate waste site and turn the APO switch 'ON'.

NOTICE

Do not dump waste in any area which might violate local, state or federal law. Drain the recovery tank into a sanitary drain system.

NOTICE

The APO will not engage until the water level rises inside the recovery tank.

8. Now proceed with the cleaning operation.

NOTICE

The machine will automatically shut down when the recovery tank reaches its full capacity due to the float switch located inside the tank. When this occurs, turn the switch off and empty the recovery tank. Then, turn the unit back on and continue to clean.

ZEROREZ CDS DAILY SHUT DOWN

NOTICE

If freeze guarding is necessary, perform the freeze guard procedure at this time as outlined in Vacuum Freeze Guard Kit Instructions for P/N 000-078-078.

1. Lay vacuum hoses out in order for all moisture to be removed from the hoses. This prevents spillage of any dirty solution in your vehicle when storing the hoses.
2. Disconnect the hoses and put them away.
3. Allow the unit to run for a few minutes with the vacuum hose disconnected in order to remove all moisture from the vacuum pump.
4. Plug the vacuum inlets. Spray lubricant into the lube port for about 5 to 10 seconds while the unit is running. This will lubricate the vacuum pump and prevent it from rusting. (The lube port is located on the front panel above the pressure gauge.)
5. Remove the inlet plugs, then turn the ignition "OFF" before draining the recovery tank.
6. Turn the heat control valve to the 'OFF' position. This will help avoid engine overheat problems due to reduced coolant flow through the radiator.
7. Drain the recovery tank.

NOTICE

Do not dump waste in any area which might violate local, state or federal law. Drain the recovery tank into a sanitary drain system.

8. When the recovery tank is drained, lift the recovery tank lid and remove the filter basket.
9. Clean out any accumulated debris.
10. Rinse and re-install.

HYDRACRADLE TANK DAILY SHUT DOWN

To shut down the HydraCradle Tank after daily use:

1. Clean out the vacuum hose and, pressing on the foot switch, rewind the vacuum hose onto its reel.
2. Rewind the other hose.
3. Place cleaning tools/wands in the tank's storage area.

HYDRACRADLE TANK SHUT DOWN FOR EXTENDED STORAGE

If you are want to shut down and store the HydraCradle Tank for an extended period of time:

1. Drain the remainder of the water in the tank.
2. Manually unwind the vacuum hose and remove it from the reel, rinse the hose with clean water and allow it to drain before rewinding it on the reel.
3. Unwind the solution hose, detach from the reel and completely drain the hose before rewinding it onto the reel.

CAUTION

Failure to take appropriate measures to prevent equipment damage due to freezing can result in system failure and loss of warranty on affected parts.

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3 - Freeze Guard

When operating the Zerorez CDS 4.8 during the colder months of the year, ensure that you properly freeze guard the system. No part of the Zerorez CDS 4.8 System is covered by warranty if machine damage occurs because of freezing.

CAUTION

BE SURE YOUR MACHINE IS PROTECTED! Freezing will cause component damage.

The following precautions are recommended prior to and during cleaning:

1. Run the machine before leaving for the first job to ensure nothing has frozen the night before, including hoses and tool/wand.
2. Insulate the solution hose from the cold ground by running it through an extra 1½” vacuum hose.
3. Leave vehicle doors closed until you begin cleaning; afterwards, open slightly.

NOTICE

In colder climates, insulating the vehicle walls and floor boards will help protect the unit.

4. Do not procrastinate during the cleaning operation or the hot water solution line will also freeze on the ground. The solution line should be insulated in extremely cold climates.
5. Whenever possible, store the van in a heated garage at night or over the weekend. If not possible, place a 1,500 Watt electric heater inside the vehicle, aimed directly at the machine.

CAUTION

Never use a propane heater. It causes excessive moisture on the vehicle ceiling and the possibility of it malfunctioning is therefore higher, which may cause bodily injury. If the machine and vehicle are left outside with a heater, drain water from the machine cleaning tools and hoses because they can be freeze-damaged also.

6. If the machine and vehicle are left outside with a heater, drain water from the machine cleaning tools and hoses because they can be freeze-damaged also.

To drain the machine, open the HydraCradle drain valve and allow the water to drain thoroughly from the tanks.

4 - Water Pump Maintenance

The Zerorez CDS' water pump features a dynamic low-pressure seal retainer, an innovative intermediate ring, and superior low-pressure and high-pressure seals. With its ceramic plungers and nickel-plated forged brass manifold, this high-temperature pump is ideal for use in carpet cleaning.

You must perform daily and periodic maintenance on the pump to maintain maximum performance of seals and valves.

This section of the manual explains:

- Daily Maintenance
- Periodic Maintenance
- Servicing Valves
- Water Pump Troubleshooting



DAILY MAINTENANCE

1. Check the oil level and the condition of the oil. The oil level should be up to the center of the sight glass on the back of the pump.
2. Use a SAE15W40 oil.

CAUTION

If the oil becomes discolored and contaminated, one of the oil seals may be damaged. Refer to the Pump Owner's Manual, included with this Owner's Manual, for more information.

Do not operate the pump if the crankcase has been contaminated with water.

CAUTION

Do not leave contaminated oil in the pump housing or leave the housing empty. Remove contaminated oil as soon as it is discovered and replace it with clean oil.

CAUTION

Do not turn the drive shaft while the oil reservoir is empty. Equipment damage can be the result.

CAUTION

Protect the pump from freezing. Freezing will cause component damage.

PERIODIC MAINTENANCE

Change the oil after the first 50 hours of operation, with the pump stopped and the oil still warm, and after every 300 operating hours or 3 months of operation. When changing the oil, remove the drain plug on the oil drain hose so all oil and accumulated sediment will drain out.

The initial oil change is recommended for no other reason than to eliminate impurities that may be in the oil during the running-in phase. If these impurities are not removed, but are allowed to remain in the oil, they may cause premature wear to the moving parts and the oil seals.

NOTICE

If the pump works in conditions with high humidity and with sharp temperature changes, condensation may appear inside the crankcase. Condensation mixing with the oil can change the oil's properties, which is easy to detect because the oil changes to a white, milky color.

If the pump does not have excessive water leaking from the packings, and the oil becomes milky, the oil has to be changed more frequently.

SERVICING VALVES

Removing a Valve

1. Remove the valve cap (30 mm) and extract the valve assembly (see Figure 4-1).



Figure 4-1. Remove Valve Cap and Valve Assembly

2. Remove the valve assembly (retainer, spring, valve plate, valve seat) from the valve cavity.
3. Remove the O-ring and support from the valve cavity.
4. Examine the O-ring and replace if there is any evidence of cuts, abrasion, or distortion.
5. Inspect the manifold for wear or damage (see Figure 4-2).
6. Inspect the old valves for wear or damage. Only one valve kit is necessary to repair all the valves in the pump. (The kit includes new supports, O-rings, valve seat, valve poppet, spring and retainer; all are pre-assembled.)



Figure 4-2. Inspect Manifold and Old Valves

7. Replace the center inlet check valve with a modified check valve (see Figure 4-3).

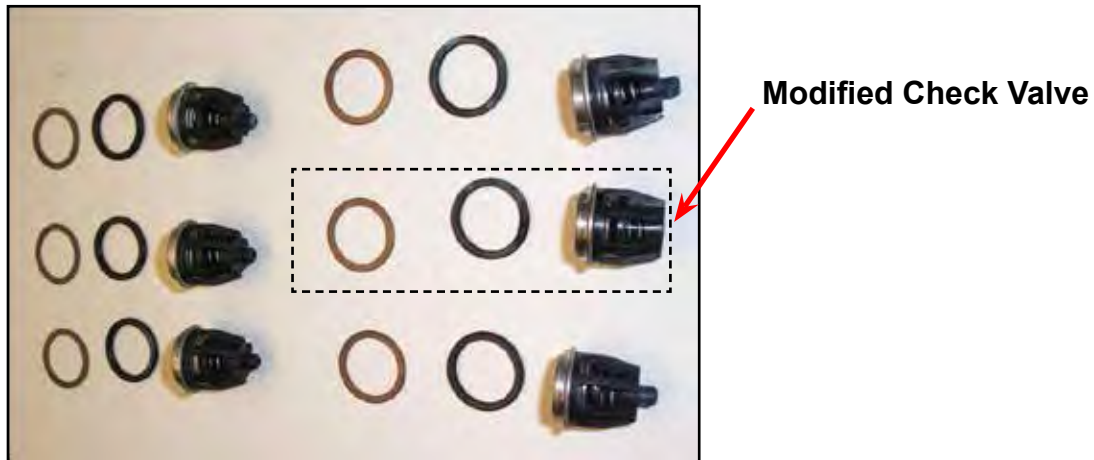


Figure 4-3. Place Center Inlet Check Valve With Modified Check Valve

8. Apply O-ring grease to O-rings and install valves (Figure 4-4).
9. Replace valve cap and torque to 95 ft-lbs (see Figure 4-5).
10. Remove the fasteners retaining the manifold.



Figure 4-4. Apply Grease and Install Valves



Figure 4-5. Replace Valve Cap

11. Separate manifold from crankcase (see Figure 4-6).

NOTICE

It may be necessary to rotate crankshaft or tap manifold with rawhide or plastic mallet to loosen.



Figure 4-6. Separate Manifold from Crankcase

CAUTION

When sliding manifold from crankcase, use caution not to damage ceramic plungers.

12. The seal assemblies may come off with the manifold (see Figure 4-7).
13. Examine the ceramic plungers. The surface should be smooth and free from scoring, pitting or cracks (see Figure 4-8); if not, replace.



Figure 4-7. Seal Assemblies May Come Off with Manifold



Figure 4-8. Examine Ceramic Plungers

14. Loosen the stainless steel plunger bolt.
15. Remove the stainless steel plunger bolt and ceramic plunger from the plunger guide (see Figure 4-9).
16. If the slinger washer is removed, be certain it is re-installed or replaced.

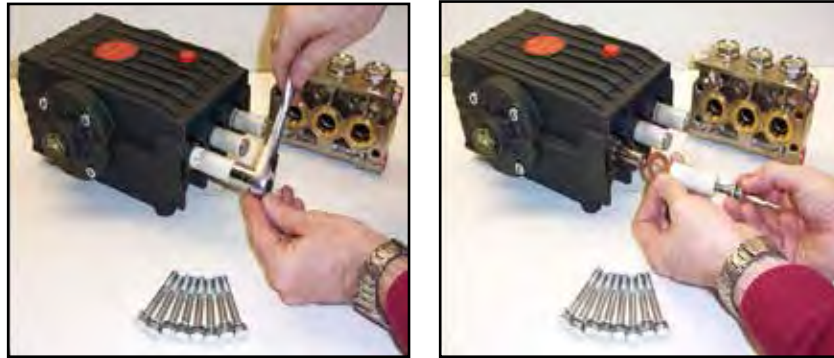


Figure 4-9. Remove Stainless Steel Plunger Bolt and Ceramic Plunger

17. Separate plunger bolt from ceramic plunger (see Figure 4-9).
18. Install new Teflon® back-up ring and O-ring on the plunger bolt. Apply a film of O-ring grease on the outside of the O-ring (see Figure 4-10).
19. Apply removable anaerobic thread sealant (Loctite® 542) to the threads of the plunger bolt, carefully pressing the plunger bolt into ceramic plunger (see Figure 4-10).

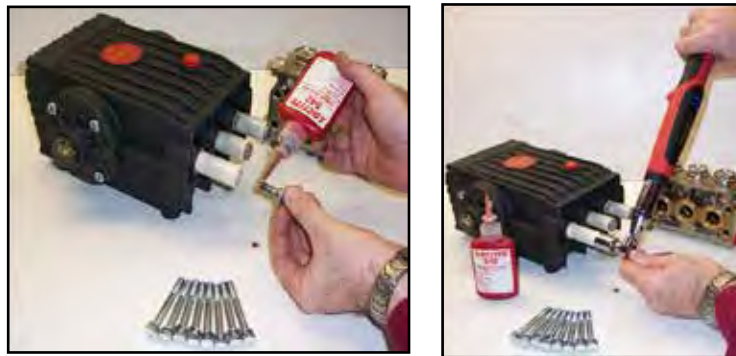


Figure 4-10. Install O-ring, Apply Sealant and Slide Plunger over Plunger Guide

20. Slide new ceramic plunger over the plunger guide (see Figure 4-10).
21. Torque plunger to 14.5 ft.-lbs.

Extracting Seals

With manifold removed from crankcase:

1. Insert proper extractor collet through main seal retainer (see Figure 4-11).
2. Tighten collet and extract retainers and seals.

NOTICE

The Teflon seals of the HT series will be damaged during disassembly so new ones will have to be installed.

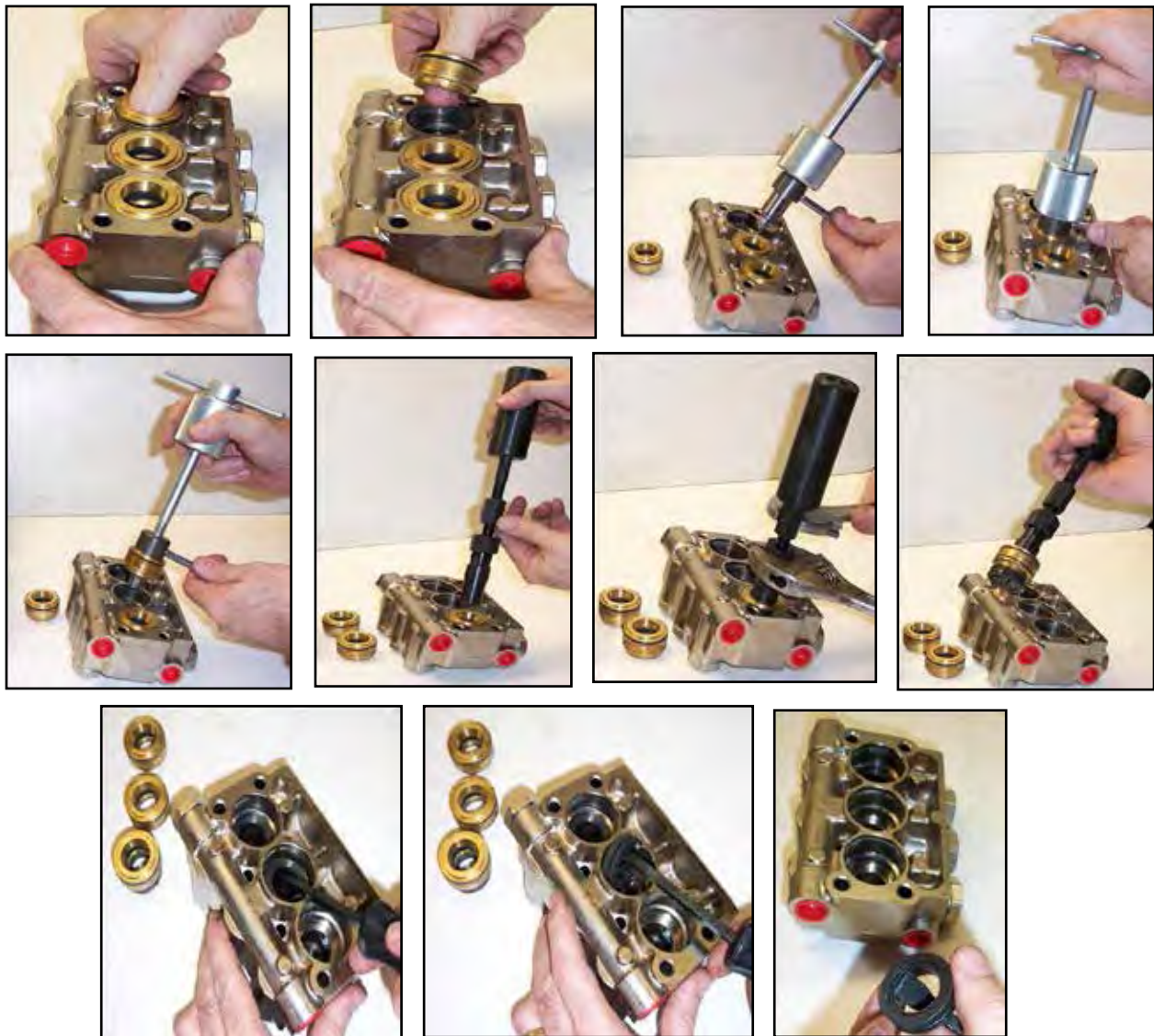


Figure 4-11. Extract Retainers and Seals

Replacing the Seal Assemblies

Only one seal kit is necessary to repair all the seals in the pump (see Figure 4-12). Use an insertion tool for seal installation



Figure 4-12. Seal Kit and Insertion Tool for Seal Installation

To install a seal assembly:

1. Apply a film of O-ring grease on the O-ring on the outside of the new high pressure seal.
2. Insert the high pressure seal into the cavity with the “U” shape down.
3. Press high pressure seal into place.
4. Apply a film of grease on the O-ring on the brass retainer (see Figure 4-13).

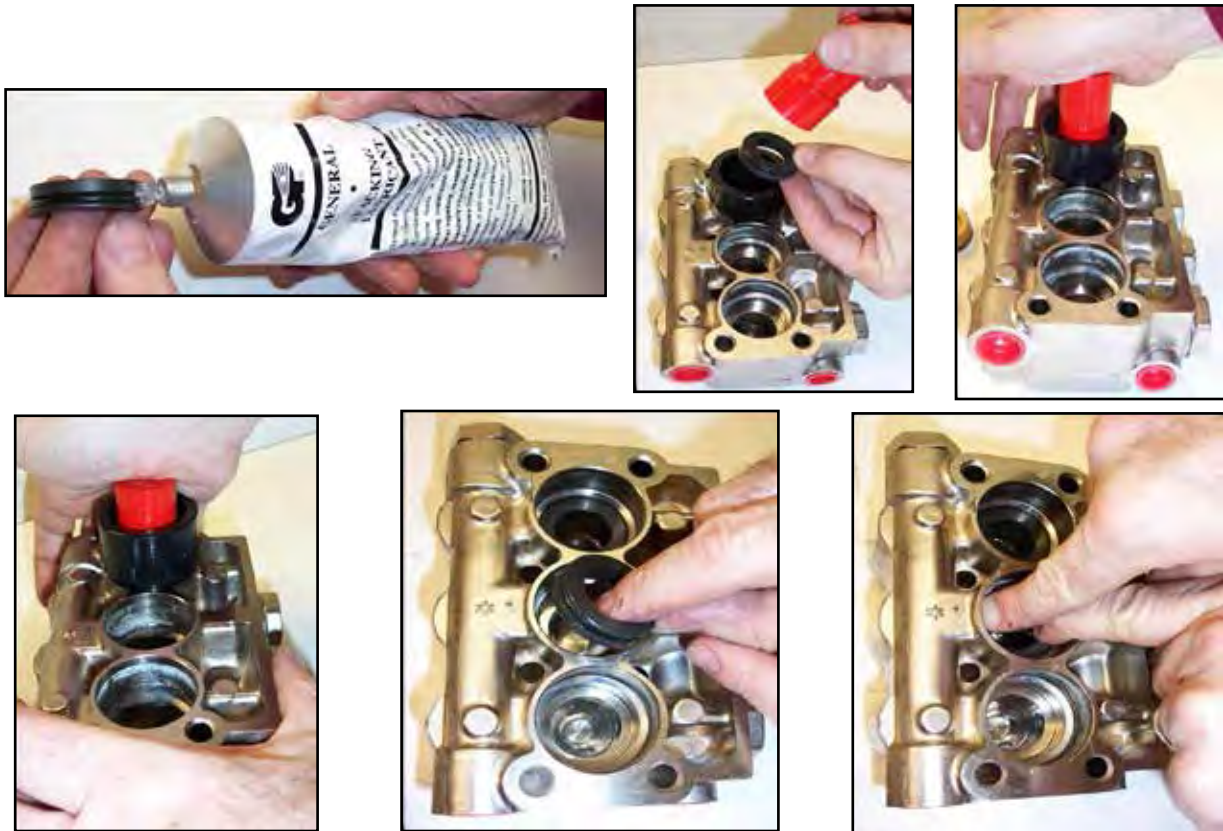


Figure 4-13. Install Seal Assembly Using O-Ring Grease

To install the intermediate retainers and the low pressure seals:

1. Insert the brass intermediate retainer into the cavity.
2. Press the new low pressure seal into the brass low pressure seal retainer and install a new O-ring on the outside (see Figure 4-14).

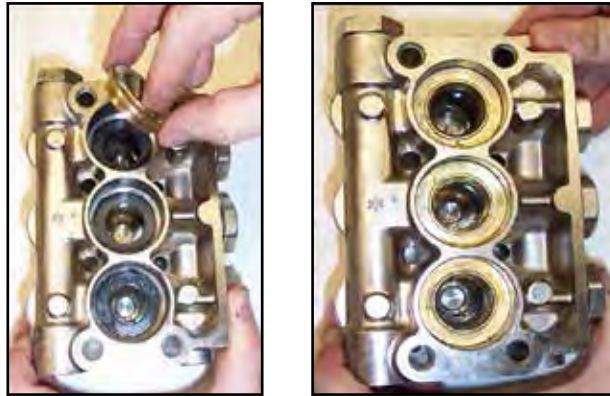


Figure 4-14. Install Retainers into Cavities

3. Press the low pressure seal assembly into the cavity (see Figure 4-15).

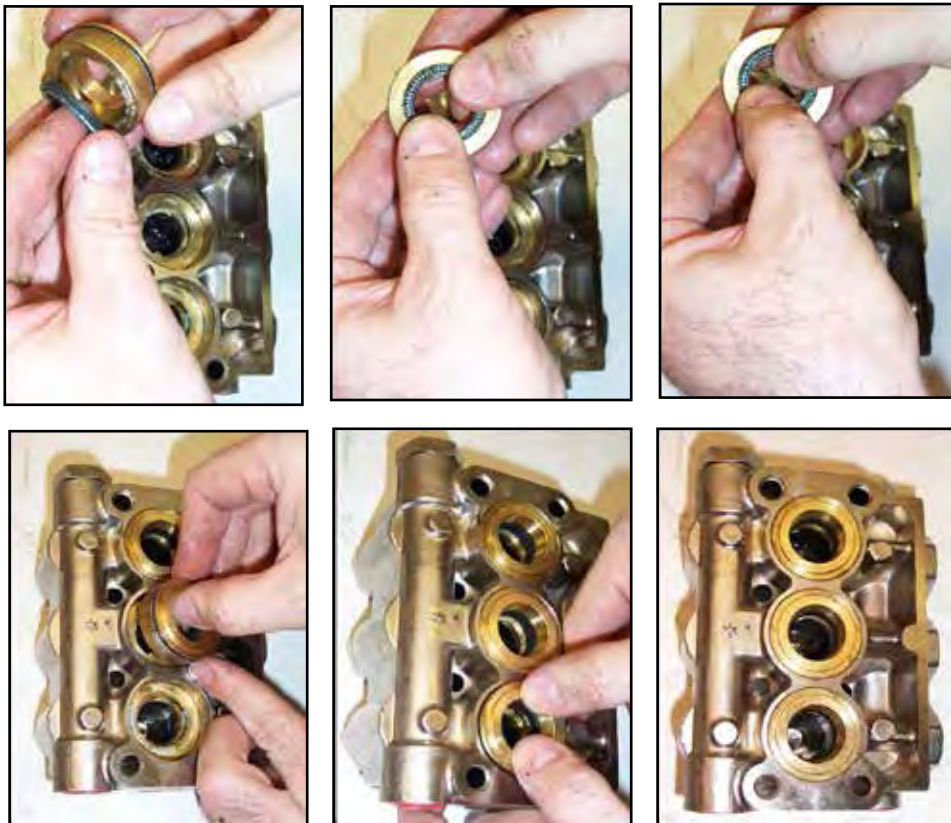


Figure 4-15. Press Low Pressure Seal Assembly into Cavity

Re-Installing Manifold

1. Position the outer plungers at the same position (see Figure 4-16).
2. Re-install manifold and torque the fasteners in an "X" pattern to 50% of specification and then retorque to 100% specification (see Figure 4-17 and Figure 4-18).

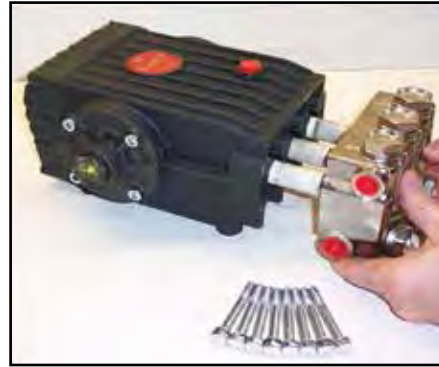


Figure 4-16. Re-install Manifold and Torque Fasteners



**Figure 4-17. Torque Sequence
in "X" Pattern**



**Figure 4-18. Torque Bolts to
22 ft.-lbs (3 m-kgs)**

WATER PUMP TROUBLESHOOTING

1.0. Will not come up to normal cleaning pressure

Probable Cause	Solution
1.1. Pressure adjusting valve is defective or dirty.	Disassemble valve. Repair or replace as necessary.
1.2. Worn seals or valves in pump.	Test pump output volume directly from pump at normal operating rpm. If volume is below manufacturer's specifications, replace seals and inspect for defective valves.
1.3. Pump rpm is too low.	Check engine rpm and adjust as necessary. Check for loose pump belt. Adjust tension as necessary.
1.4. Primary system control orifice is missing or loose.	Remove filter and inspect. Tighten or replace as necessary.
1.5. Primary orifice is worn.	Measure orifice size and replace as necessary.

2.0. No pressure reading on PSI gauge

Probable Cause	Solution
2.1. Pump switch is not turned on.	Turn on switch
2.2. Pump belt is broken.	Replace belt.
2.3. Pump clutch is not activated. No water in tanks.	Check system back to source to locate cause of interruption to water flow.
2.4. Pump clutch is not activated.	Check for 12 volts at clutch. If 12 volts is present, replace clutch.
	If 12 volts is not present, check power to the low-water relay. If there is 12 volts at the relay, check low water switch in water box.
	If low water switch has no continuity when float is up, replace the switch. If switch is good, replace the low water relay.

3.0. PSI gauge reads normal: low pressure from tool/wand

Probable Cause	Solution
3.1. There is a restriction in the cleaning tool/wand.	Inspect tool jet and clean or replace as necessary. Inspect any filters in the cleaning tool and clean or replace as necessary.
3.2. There is a defective quick connect in the system.	Inspect each quick connect and replace as necessary.
3.3. There is a restriction in solution hose.	Remove quick connects and inspect hoses. Clean or replace as necessary.

4.0. Pressure pulsation

Probable Cause	Solution
4.1. Water is too hot and is approaching boiling point.	Check temperature of water.
4.3. One of the intake or outlet valves in the high-pressure pump is defective or is being held open by debris.	Remove each valve and inspect for correct operation.

5 - Vacuum Blower System

This section of the manual covers the Zerorez CDS' vacuum blower system and includes information on:

- Inlet Filter
- Vacuum Blower Lubrication
- Vacuum Blower Troubleshooting

The vacuum blower, featuring tri-lobe rotors, is designed for maximum positive displacement and manufactured using special porting technology to significantly reduce noise.



Lubrication for both the gear end and drive end of the blower is provided by full oil splash. Unlike grease lubrication, oil-splash lubrication provides for longer bearing and seal life through improved heat dissipation.

At the gear end, the timing gear teeth are lubricated by submersion in oil with the gear teeth serving as oil slingers. At the drive end, the bearings are also lubricated by submersion in oil with oil slingers attached on the shafts.

The performance and life of the vacuum blower is greatly dependent on the care and proper maintenance it receives.

Because of the close tolerances between the 3 lobes and housing of the vacuum blower, solid objects entering the inlet will damage the internal lobes, gears, bearings or drive system.

To prevent this from happening, a stainless steel filter screen has been placed at the vacuum blower intake inside the vacuum recovery tank. This stainless steel filter system should be removed for cleaning on a daily basis.

⚠ WARNING

Use caution when the Zerorez CDS 4.8 is being run for test purposes and the vacuum inlet is open. Unregulated vacuum may cause injury if body parts come in contact with the open vacuum inlet.

CAUTION

To protect the vacuum blower from overloading and damaging itself, there is a vacuum relief system installed on the vacuum recovery tank. When the recovery tank inlet is completely sealed off, a maximum of 14" Hg will be attained. At the end of each day, spray an oil-based lubricant into the blower lubrication port before shutting down the machine. If you fail to lubricate the vacuum blower on a daily basis, rust deposits and moisture can form and decrease the life of the vacuum blower.

CAUTION

The recovery tank is protected from excessive water level overflowing by a recovery tank float kill switch. The switch is activated only by liquid.

RECOVERY TANK INLET FILTER

HydraMaster inlet filter screens are designed to trap lint, hair and large objects that would normally collect at the bottom of your recovery tank. Clean the screen at the end of each job to eliminate build-up of debris in the tank.

VACUUM BLOWER LUBRICATION

Read the vacuum blower Owner's Manual, included with this Owner's Manual, for proper oil changing instructions. Because the Zerorez CDS is very demanding of the vacuum blower, the vacuum blower should be maintained as recommended in the vacuum blower Owner's Manual.

Remember to:

1. Remove vented oil fill plug on front or rear oil case.
2. Fill with specified oil until it registers to the top of the sight glass.
3. Use lubricants as listed in the Table 5-1.
4. Add fresh oil as required to maintain proper level.

The oil should be drained, flushed and replaced every 300 hours. The oil drain hose is connected under the head plate; at the end of the oil drain hose is a cap.

Table 5-1. Lubricants for Oil-Lubricated Gears and Bearings

Ambient Temperature*	Oil Grade USA	Oil Viscosity, Centistokes at 40° F
Below 32° F	SAE 20 Non-Detergent	100
32° to 100° F	SAE 40 Non-Detergent	200
Over 100° F	SAE 50 Non-Detergent	250

*Refers to ambient air temperature at the cleaning tool

In applications with extreme variations in ambient temperature, a 20W - 50W multiple viscosity oil is recommended.

VACUUM BLOWER TROUBLESHOOTING

1.0. Weak vacuum at tool/wand. Gauge reads normal (10” Hg to 14” Hg)

	Probable Cause	Solution
1.1.	Clogged hoses or tool/wand tube.	Disconnect hoses and carefully check for an obstruction.
1.2	Excessive length of hoses connected to machine.	Make sure machine is rated for the conditions under which it is being operated.

2.0. Vacuum gauge will not come up to 14” Hg

	Probable Cause	Solution
2.1	There is an air leak somewhere in the vacuum system.	Check vacuum relief valve for proper adjustment. Check all hoses for cuts and breaks. Check recovery tank lid gasket. Make sure the recovery tank drain valve is fully closed.
2.2	The vacuum gauge is defective.	Test and replace as necessary.
2.3	Vacuum blower is turning too slowly.	Check blower rpm at tachometer on the CDS’ dash. Blower rpm should be 2 times the tachometer rpm. See the throttle control kit instructions for further troubleshooting assistance.

3.0. Vacuum gauge reads high with no hoses attached

	Probable Cause	Solution
3.1	Filter in recovery tank is clogged.	Remove and clean or replace as necessary.
3.2	Hose from recovery tank to blower is collapsed internally.	Inspect and replace as necessary.

4.0. Noisy Vacuum Blower

	Probable Cause	Solution
4.1.	Vacuum blower is low on oil.	Inspect oil level and replenish as necessary
<p>CAUTION</p> <p>Running the blower when it is low on oil will cause severe internal damage to the blower. If this situation occurs, the blower should be inspected by a qualified service technician.</p>		
4.2.	There is internal damage to blower.	Refer to qualified service technician.

5.0. Vacuum Blower is locked and will not turn

	Probable Cause	Solution
5.1.	The machine has been unused for a period of time and the blower was not properly lubricated when it was shut down, causing rust to build up on internal surfaces.	Spray penetrating oil into blower and let sit for at least 1 hour. Then very carefully use pipe wrench on outer diameter of pulley on blower shaft and attempt to free up blower. Do not use wrench directly on blower shaft. If unable to free up blower in this manner refer to a qualified service technician.
5.2.	There is internal damage to blower.	Refer to qualified service technician.

6 - Electrical System

This section of the manual contains wiring diagrams (see Figure 6-1 and Figure 6-2), an electrical schematic (see Figure 6-3) and troubleshooting guides for the service technician because the most challenging problem to trace in any system is often an electrical failure.

The electrical system (including the HydraCradle Tank) operates on 12V DC which is provided by the vehicle's battery. No additional power sources are required.

The HydraCradle's 30 Amp fuse for the foot switch/gear motor is easily accessible from the front panel of the HydraCradle.

CAUTION

To avoid equipment damage, it is very important to tie up any loose wires or hoses near the drive shaft area. Tie wraps are sufficient for wires and small hoses.

When securing large hoses or wiring harnesses in the area of the drive shaft, tie down the components with a hose clamp, with a clear vinyl hose inserted onto the clamp. On some installations, if the fuel injector wires are not properly secured, the wires could rub against the CDS drive shaft, causing a short in the electrical system of the van.

TROUBLESHOOTING

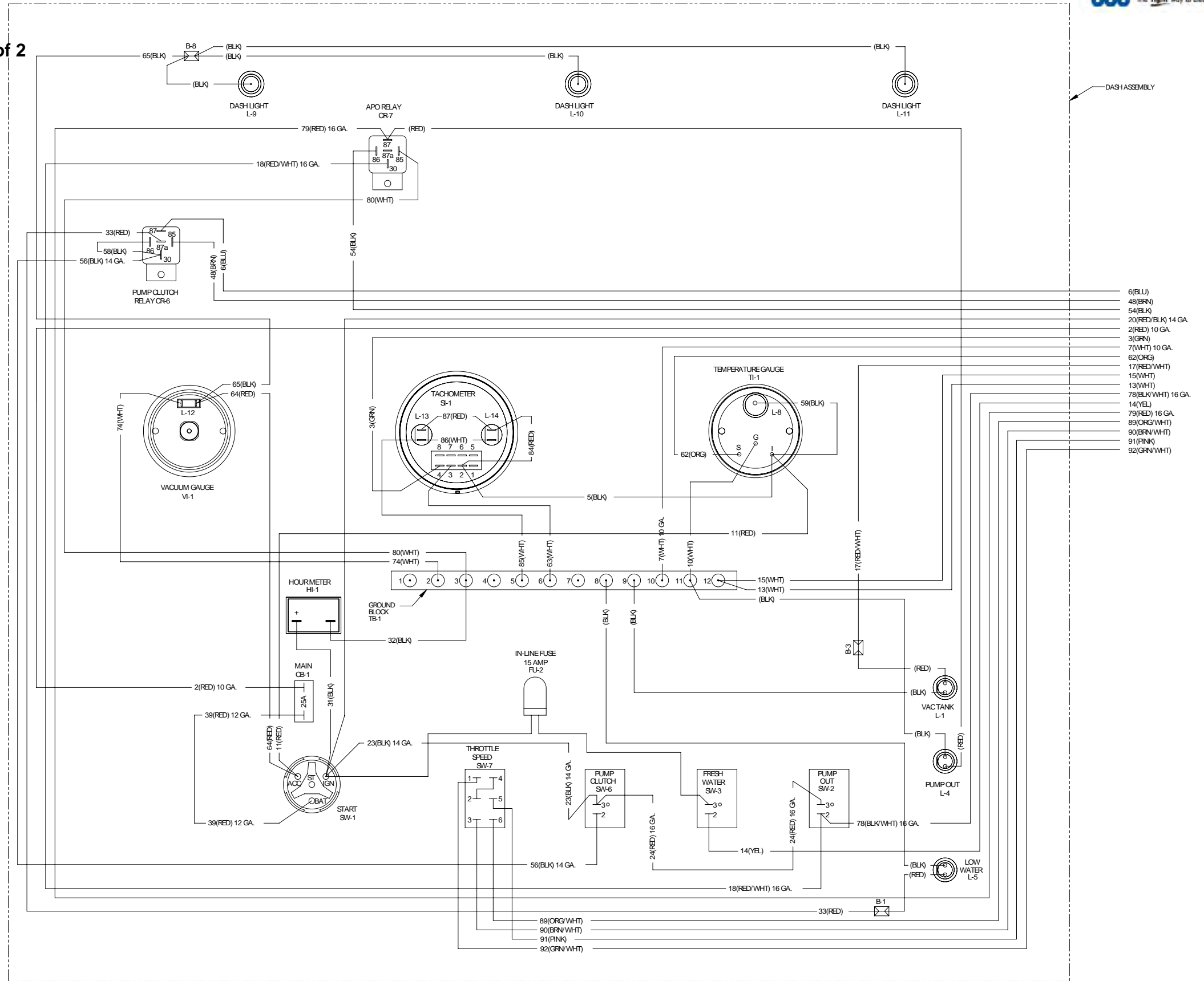
1.0. CDS will not turn on

	Probable Cause	Solution
1.1.	The main power fuse has blown.	Remove CDS cowling and engine cover and check all wiring from the power source back to the CDS console for damage. Replace fuse only after locating the problem that caused the fuse to blow. If unable to locate problem, refer to qualified service technician.
1.2.	The plug-in connection at the base of the recovery tank is corroded.	Clean and seal connection to protect it from moisture.
1.3.	The main circuit breaker has blown on the CDS dash.	Reset breaker and look for loose connections or damaged wires. Check all wires from the control panel forward to the front of the vehicle. If no problem is found but the breaker still trips refer to qualified service technician.

2.0. CDS shuts off while in use

	Probable Cause	Solution
2.1	Recovery tank is full.	Empty tank and restart machine.
2.2.	Recovery tank float switch is dirty or defective.	Inspect float to see if the triangle mark on the float is facing up. If it is, and the float slides freely on the post, replace the float assembly.
2.3.	The vehicle gear selector has moved.	Inspect the gear selector to be sure it is in the proper position. If selector has moved, refer to qualified service technician.
	<div style="background-color: #ff8c00; color: white; padding: 5px; display: inline-block;">⚠ WARNING</div> If vehicle gear selector has moved, refer to qualified service technician. This is a dangerous condition and needs to be repaired immediately.	

Figure 6-1. CDS - Wiring Diagram - View 1 of 2
000-179-013 Rev. A



*ALL WIRES ARE 18 GAUGE UNLESS OTHERWISE STATED

Figure 6-2. CDS Wiring Diagram - View 2 of 2
000-179-013 Rev. A

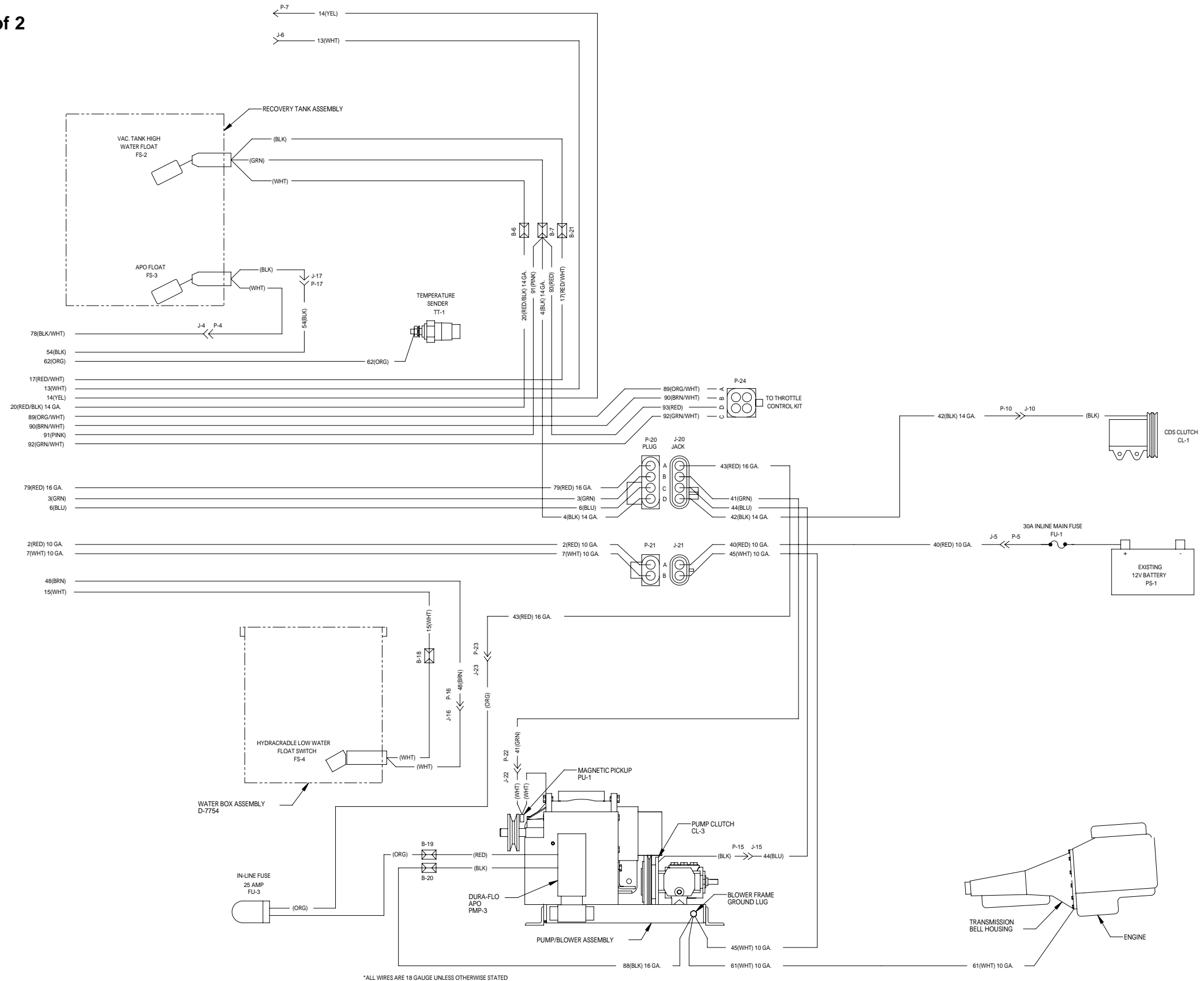


Figure 6-3. CDS Electrical Schematic
000-179-021 Rev. A

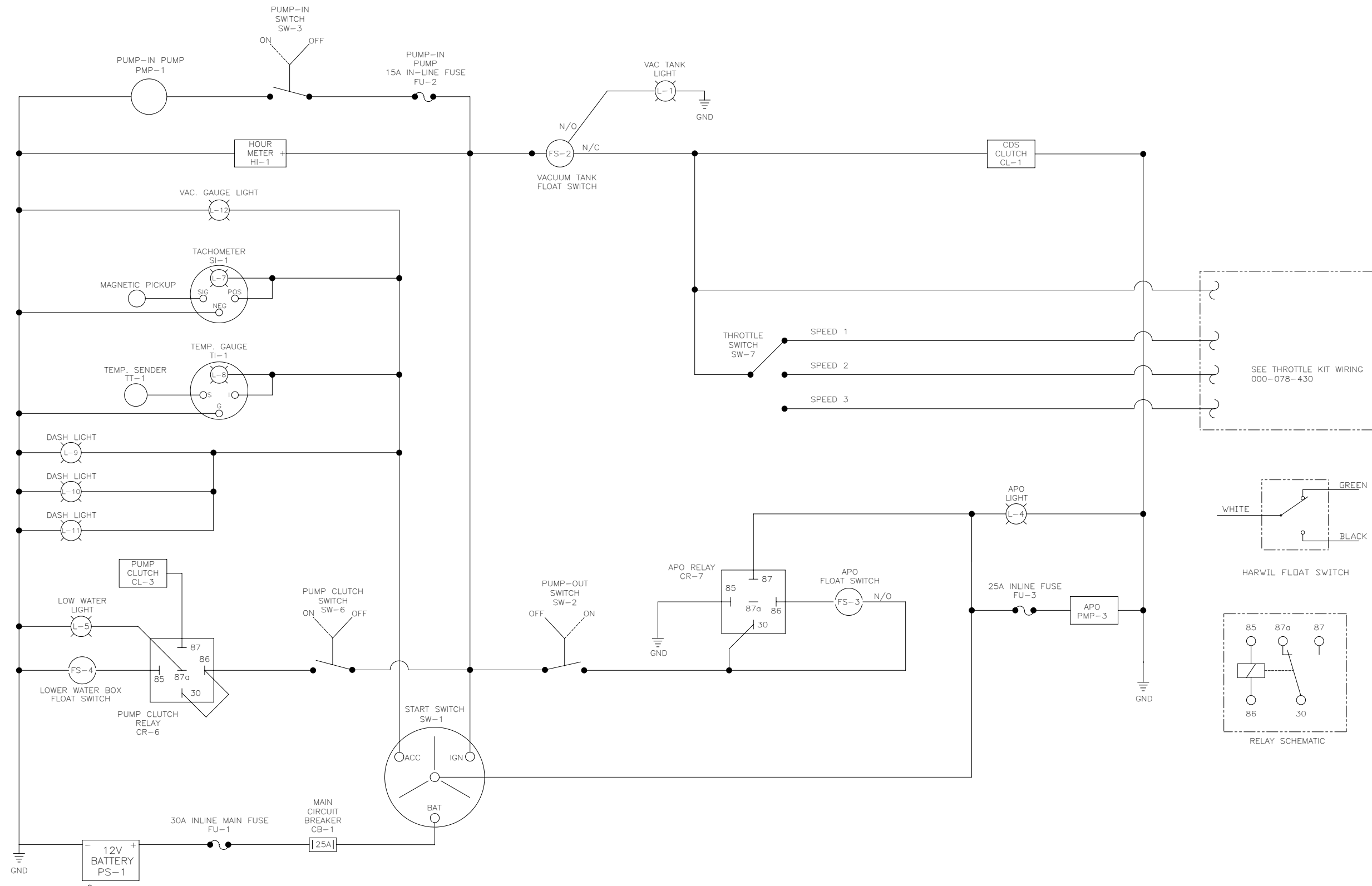
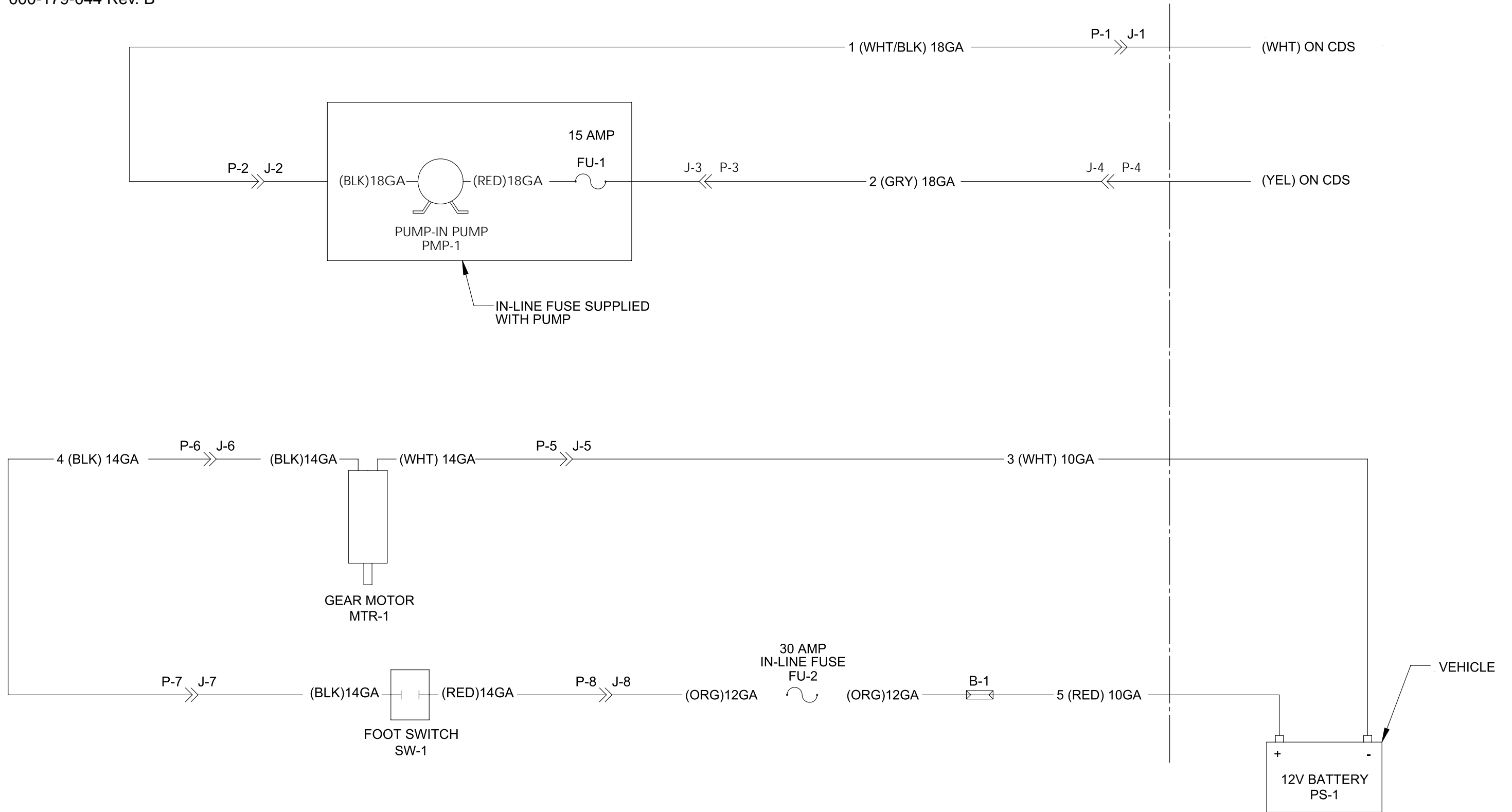


Figure 6-4. HydraCradle Wiring Diagram
000-179-044 Rev. B



7 - Assemblies and Parts Lists

This section of the manual provides detailed illustrations and parts lists for the following assemblies:

- Top Level Assembly Parts List
- Machine Level Assembly Parts List
- Power Pack Assembly Parts List
- Blower Assembly Parts List
- Pump Assembly Parts List
- Frame Assembly Parts List
- Recovery Tank Assembly Parts List
- Coolant Heat Exchanger Assembly Parts List
- Salsa Heat Exchanger Assembly Parts List
- Pass Through Assembly Parts List
- Recovery Tank Cover Assembly Parts List
- Vacuum Inlet Stopper Kit Parts List
- Vacuum Relief Valve - (Universal Recovery Tank) Assembly Parts List
- Instrument Panel Assembly Parts List
- Hi PSI Assembly Parts List
- By-Pass Valve Assembly Parts List
- APO Pump - Jabsco - Parts List
- Front End Kit Assembly Parts List
- Dura-Flow Automatic Pump Out (APO) Assembly Parts List
- Yaw Sensor Cooling Kit Assembly Parts List
- 125 Gallon HydraCradle Tank Top Level Assembly Parts List
- 125 Gallon HydraCradle Tank Subassembly Level Parts List
- Vacuum Hose Reel Assembly Parts List
- Vacuum Hose Reel Hub Assembly Parts List
- 14" Solution Hose Reel Assembly Parts List
- Hose and Fittings Assembly Parts List
- Air Vent Assembly Parts List
- Drain Hose Assembly Parts List
- Tee Assembly Parts List
- 110 Gallon Fresh Water Tank Assembly Parts List
- 110 Gallon Fresh Water Tank Lid Assembly Parts List
- Three Tier Stainless Steel Shelf Assembly Parts List
- Back Door Shelf Assembly Parts List
- Chevy Cowling Assembly Parts List
- 2nd Coolant Heat Exchanger Assembly Parts List
- 3rd Coolant Heat Exchanger Assembly Parts List
- Hose Routings List

Figure 7-1. Top Level Assembly - View 1 of 2
700-014-149 Rev. A

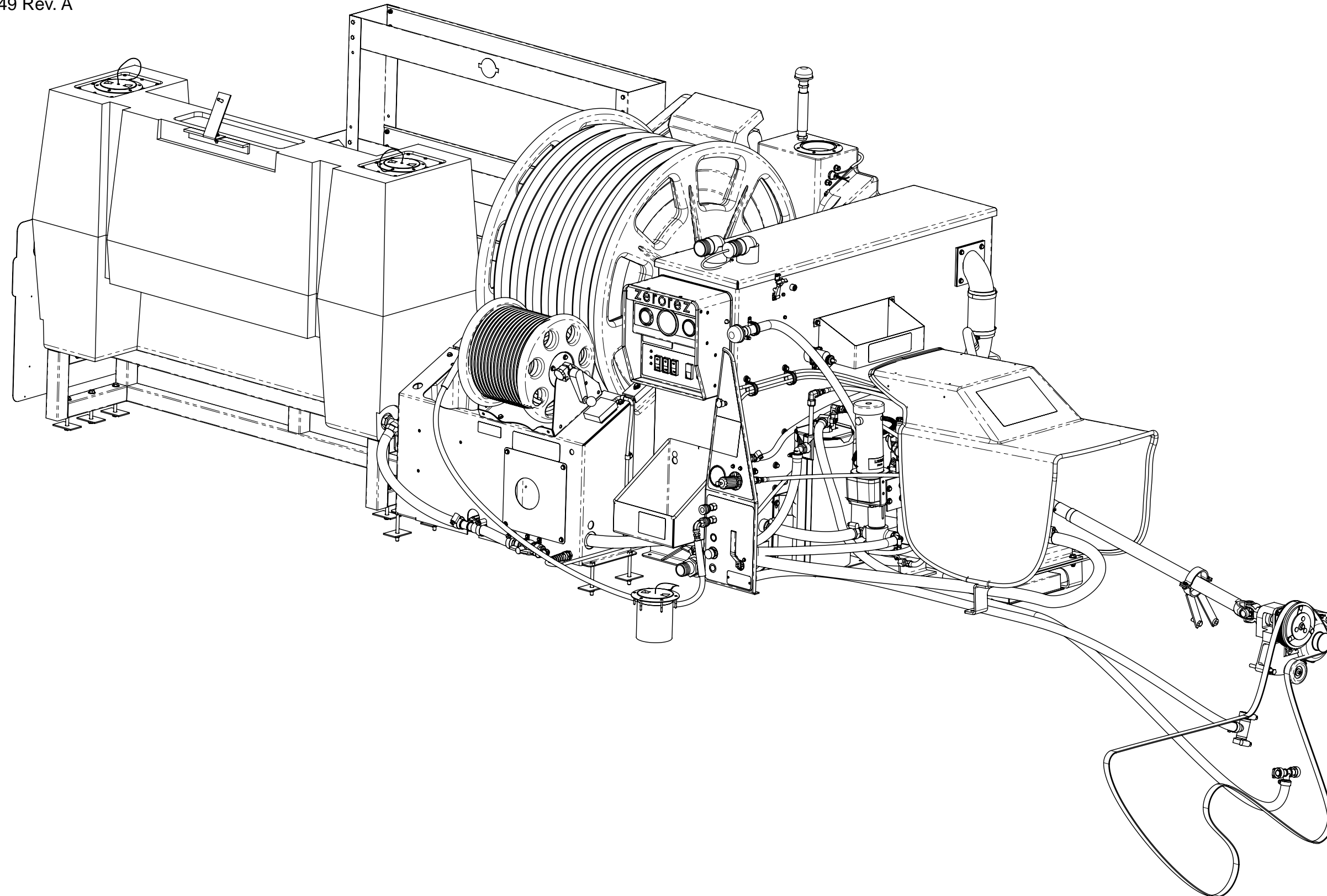
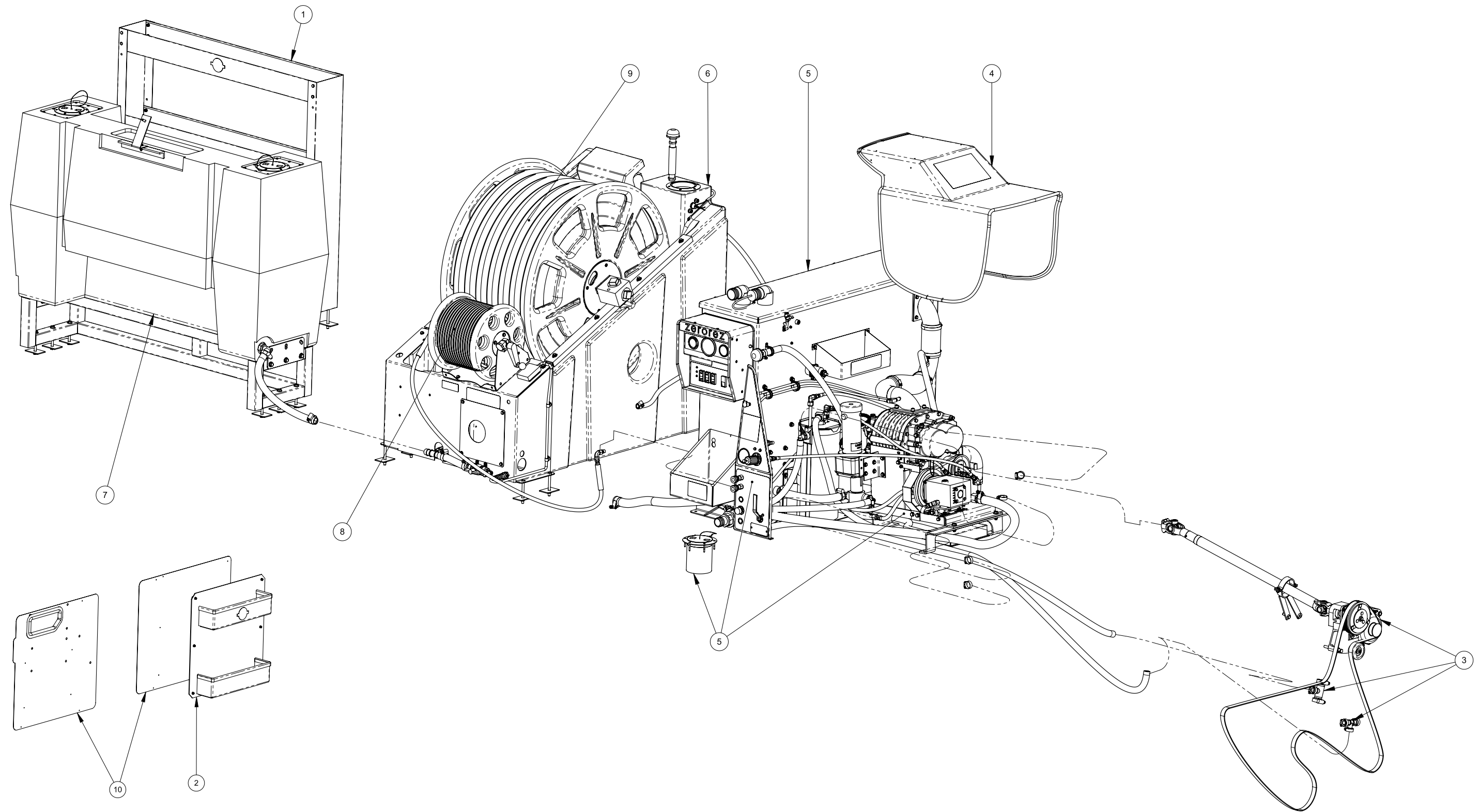


Figure 7-2. Top Level Assembly - View 2 of 2
700-014-149 Rev. A



Top Level Assembly Parts List

Item	Part Number	Description	Qty
1	000-163-038	Shelf, Three Tier, Assembly	1
2	000-163-050	Assembly, Back Door Shelf	1
3	601-021-132	Assembly, Front End	1
4	601-020-008	Assembly, Cowling	1
5	601-050-741	Assembly, Machine	1

Item	Part Number	Description	Qty
6	000-163-610	Assembly, Tank Cradle - w/ Solution Reel	1
7	000-159-119	Assembly, 110 Gallon Tank	1
8	000-068-826	Hose, 1/4" X 250 ft Sol - S/S Assembly	1
9	000-068-065	Hose, 2" X 250 ft Vacuum - Blue	1
10	000-100-021	Panel Set, Rear Door Assembly	1

Figure 7-3. Machine Assembly - View 1 of 3
601-050-741 Rev. D

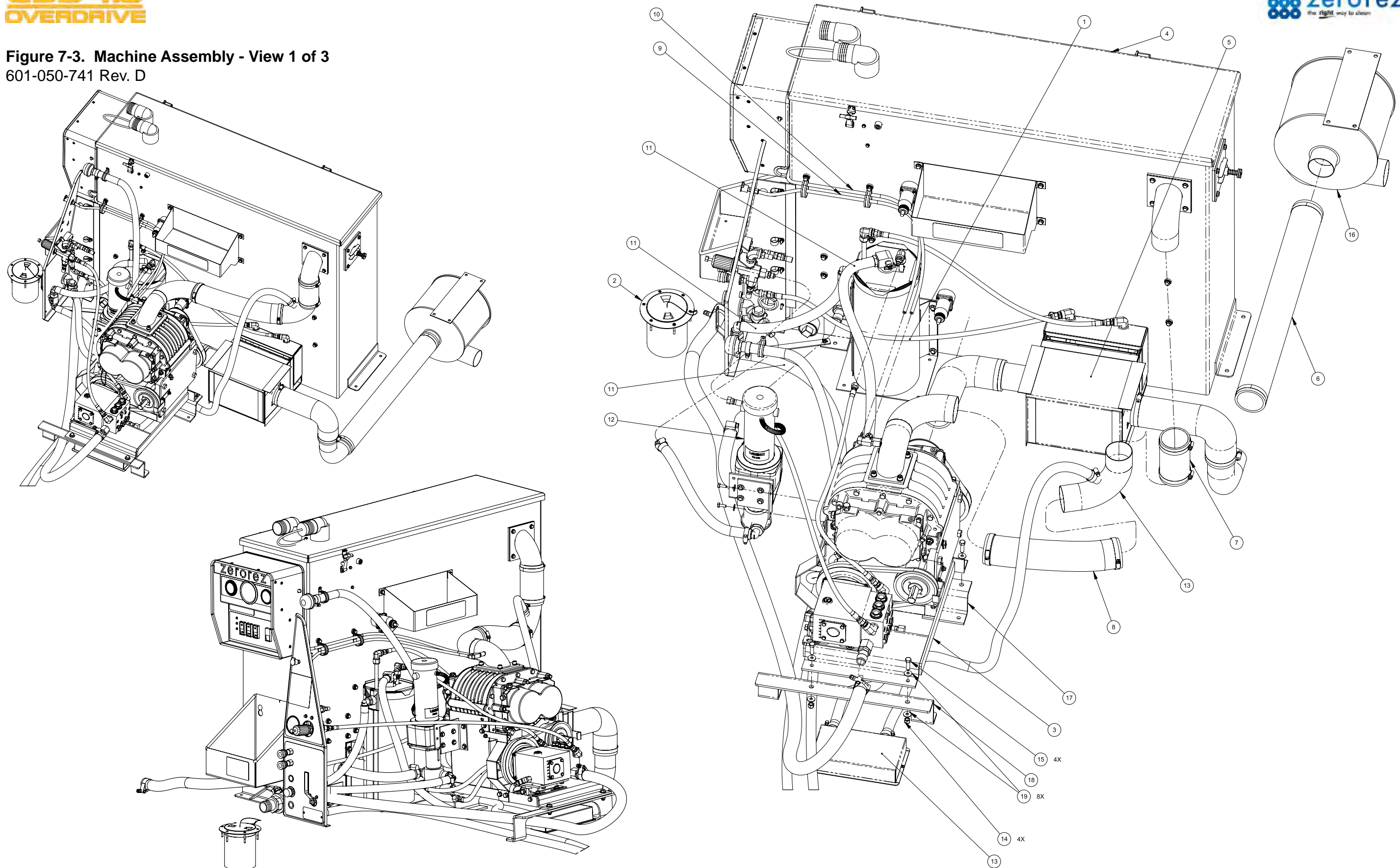


Figure 7-4. Machine Assembly - View 2 of 3
601-050-741 Rev. D

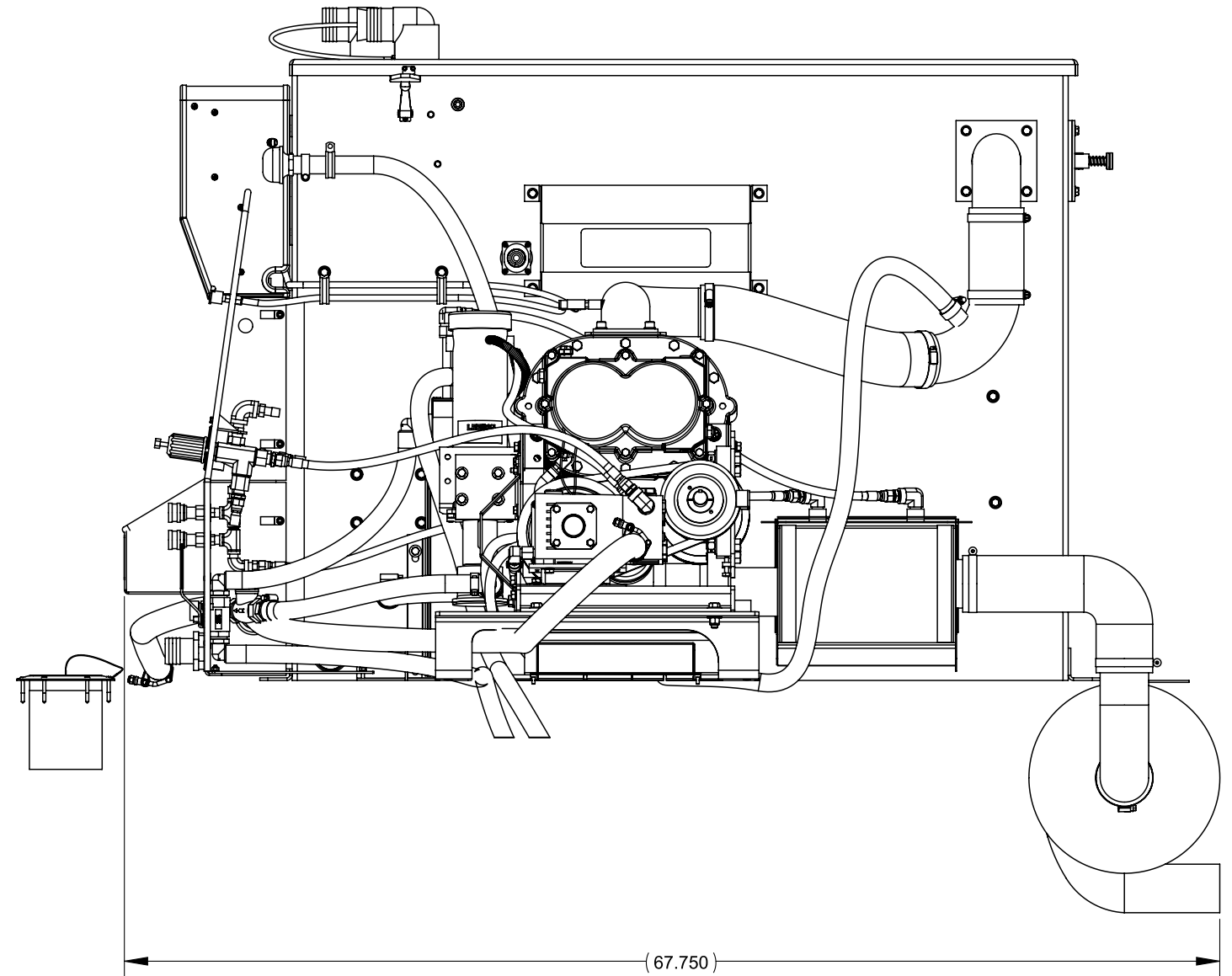
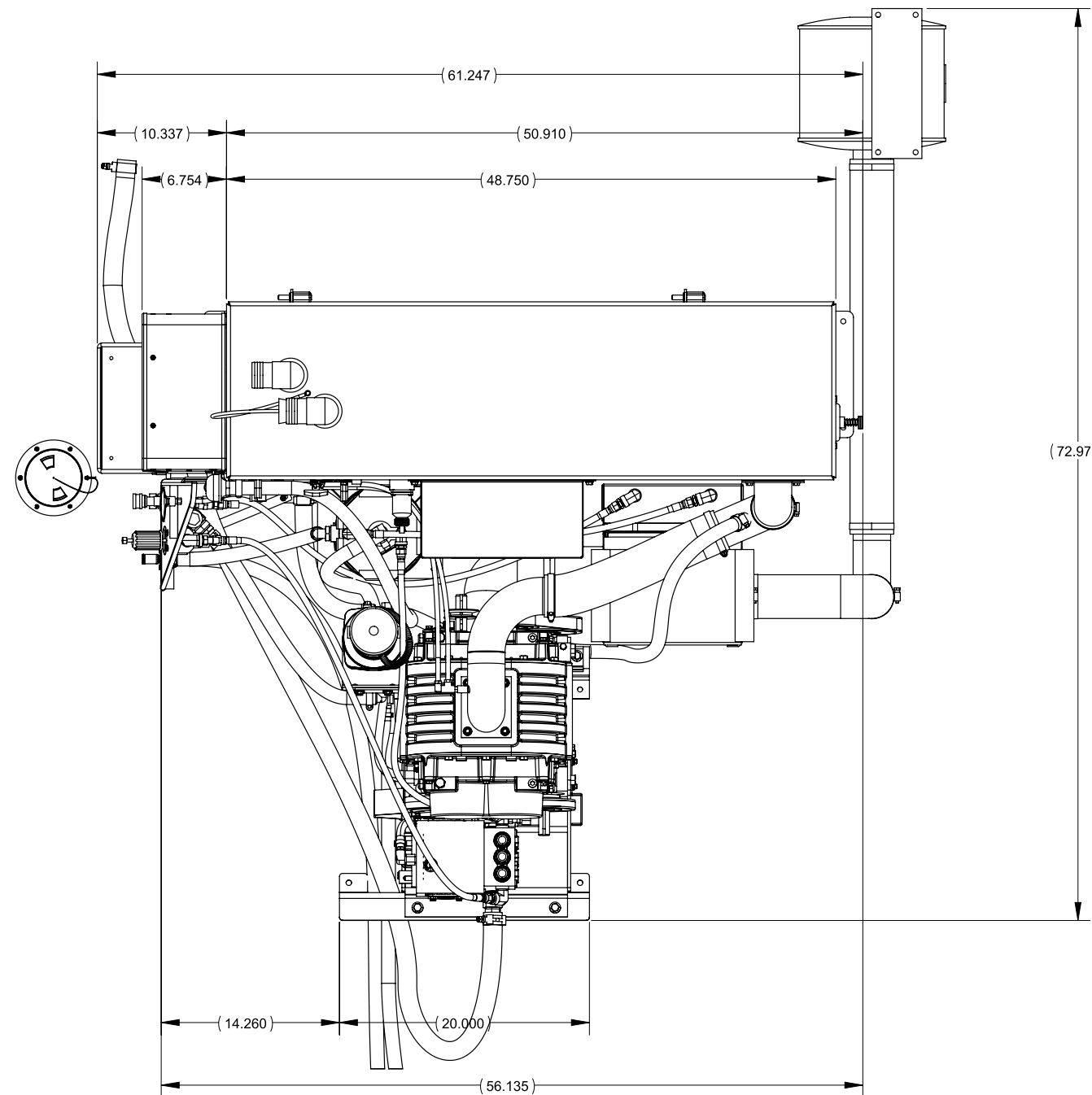
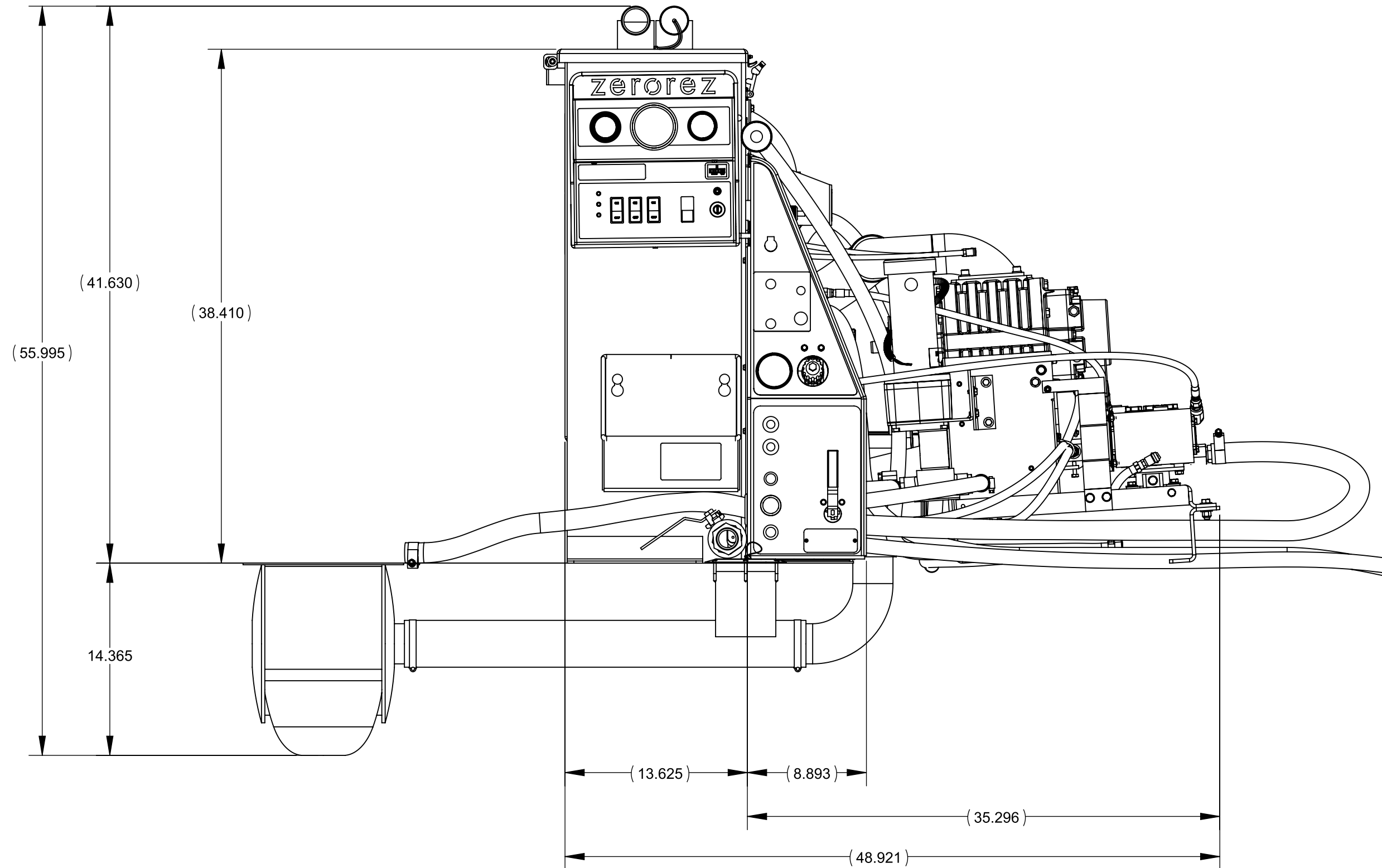


Figure 7-5. Machine Assembly - View 3 of 3
601-050-741 Rev. D



Machine Level Assembly Parts List

Item	Part Number	Description	Qty
1	601-006-741	Assembly, Coolant Heat Exchanger	1
2	000-078-381	Assembly, Pass Through	1
3	601-004-741	Assembly, Power Pack	1
4	601-060-741	Assembly, Recovery Tank	1
5	601-005-741	Assembly, Salsa Heat Exchanger	1
6	000-068-187	Hose, 3" I.D. X 30" Lg. - Assembly	1
7	000-068-200	Hose, 3" I.D. X 6" Lg. - Assembly	1
8	000-068-884	Hose, 3.0" X 13" Wire Reinforced Vacuum	1
9	000-068-978	Hose, 5/32" I.D. Vacuum X 52" Lg	1
10	000-068-977	Hose, 5/32" I.D. Vacuum X 82" Lg	1

Item	Part Number	Description	Qty
11	000-068-385	Hose, 3/4" I.D. X 18 ft - Green Stripe - Cut To Fit	1
12	000-079-001	Kit, Dura-Flow APO	1
13	000-079-130	Kit, Yaw Sensor Cooling	1
14	000-094-100	Nut, 3/8-16, Nylock	4
15	000-143-025	Screw, 3/8"-16 UNC X 1.25" Lg. Hex Head Gr. 8	4
16	000-093-030	Silencer, 3" Inlet and Outlet - Coated	1
17	000-154-147	Spacer, Power Pack - Rear	1
18	000-154-185	Spacer, Power Pack - Front	1
19	000-174-004	Washer, 5/16" Flat	8

Figure 7-6. Power Pack Assembly - View 1 of 2
601-004-741 Rev. C

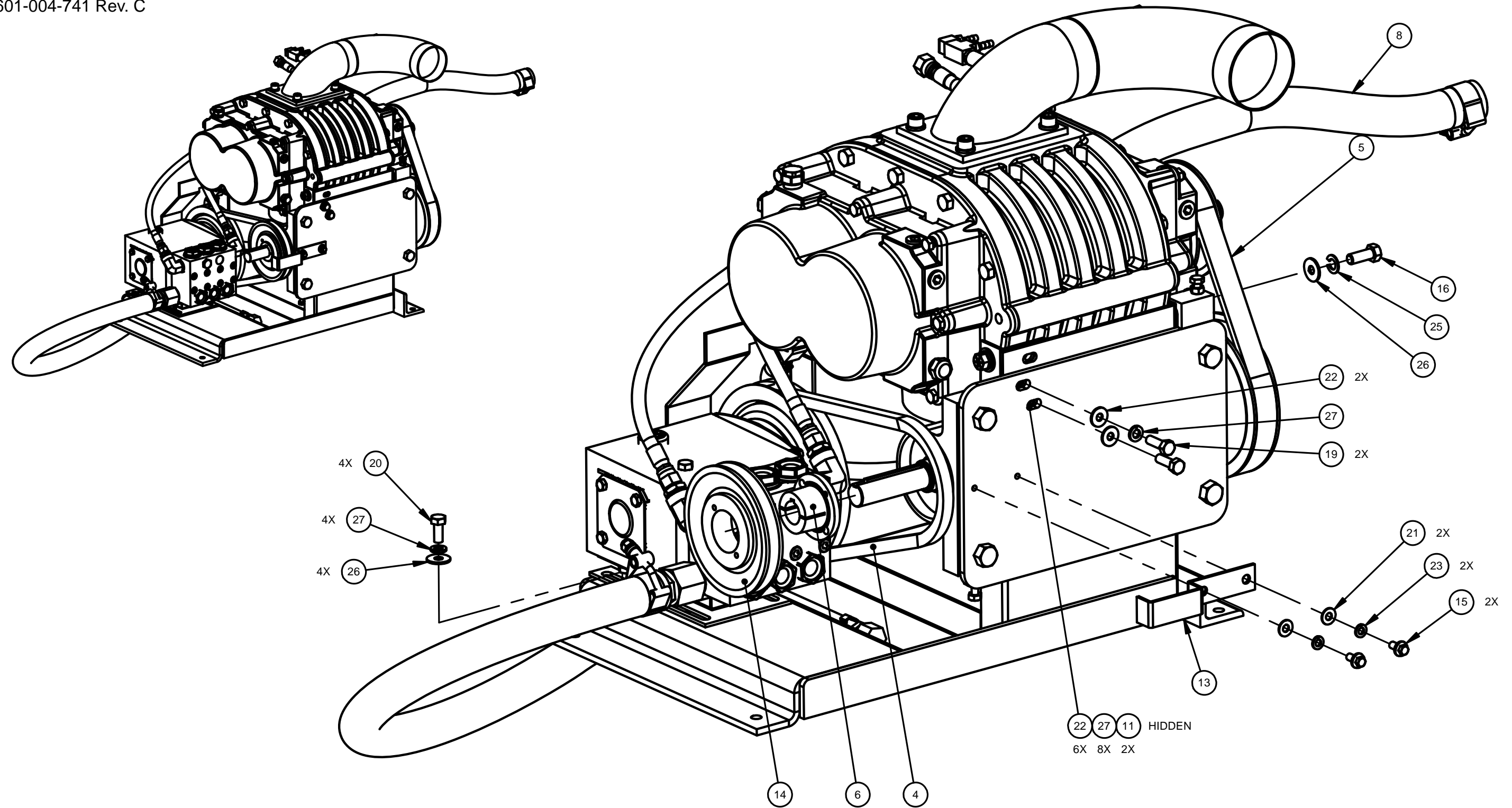
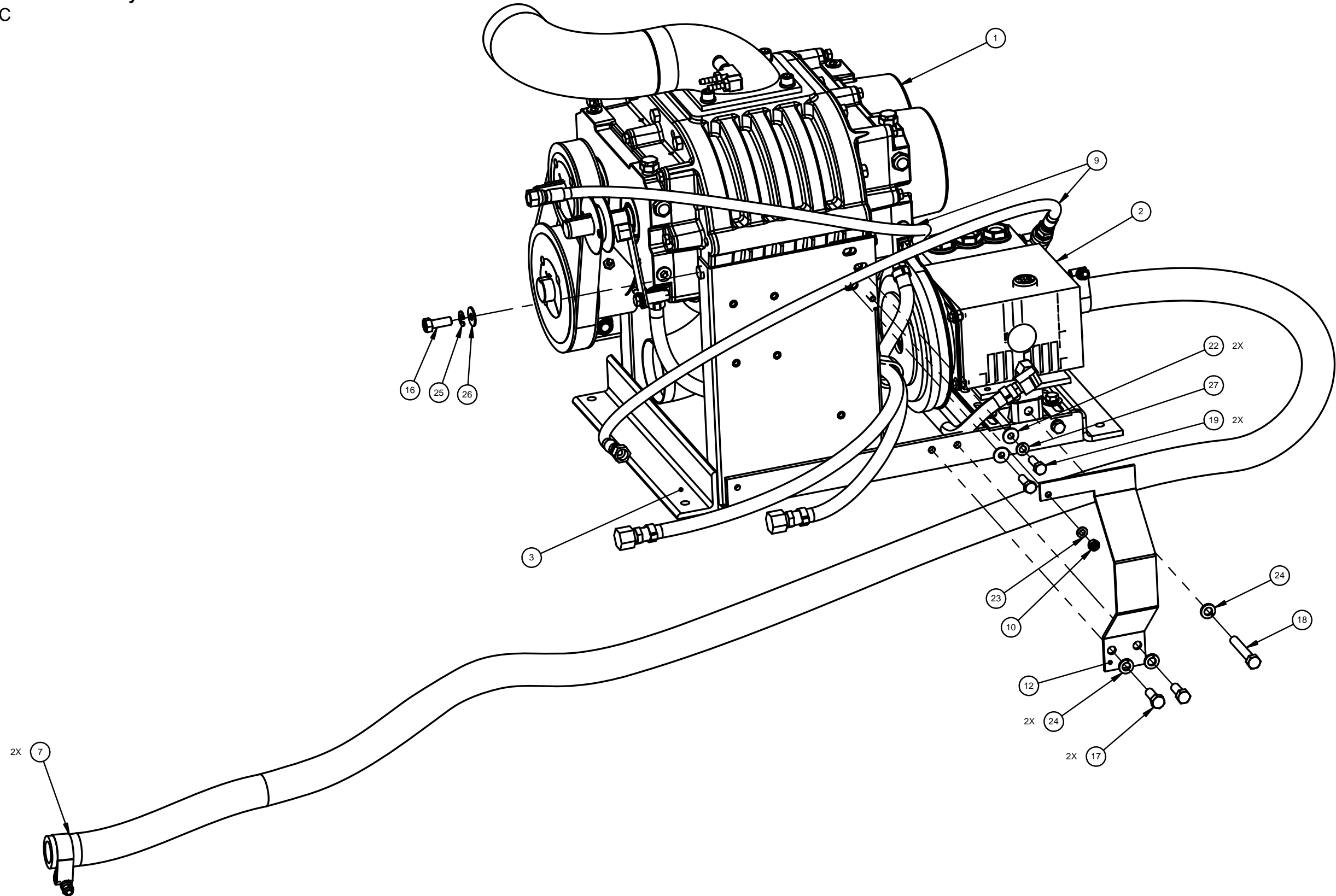


Figure 7-7. Power Pack Assembly - View 2 of 2
601-004-741 Rev. C

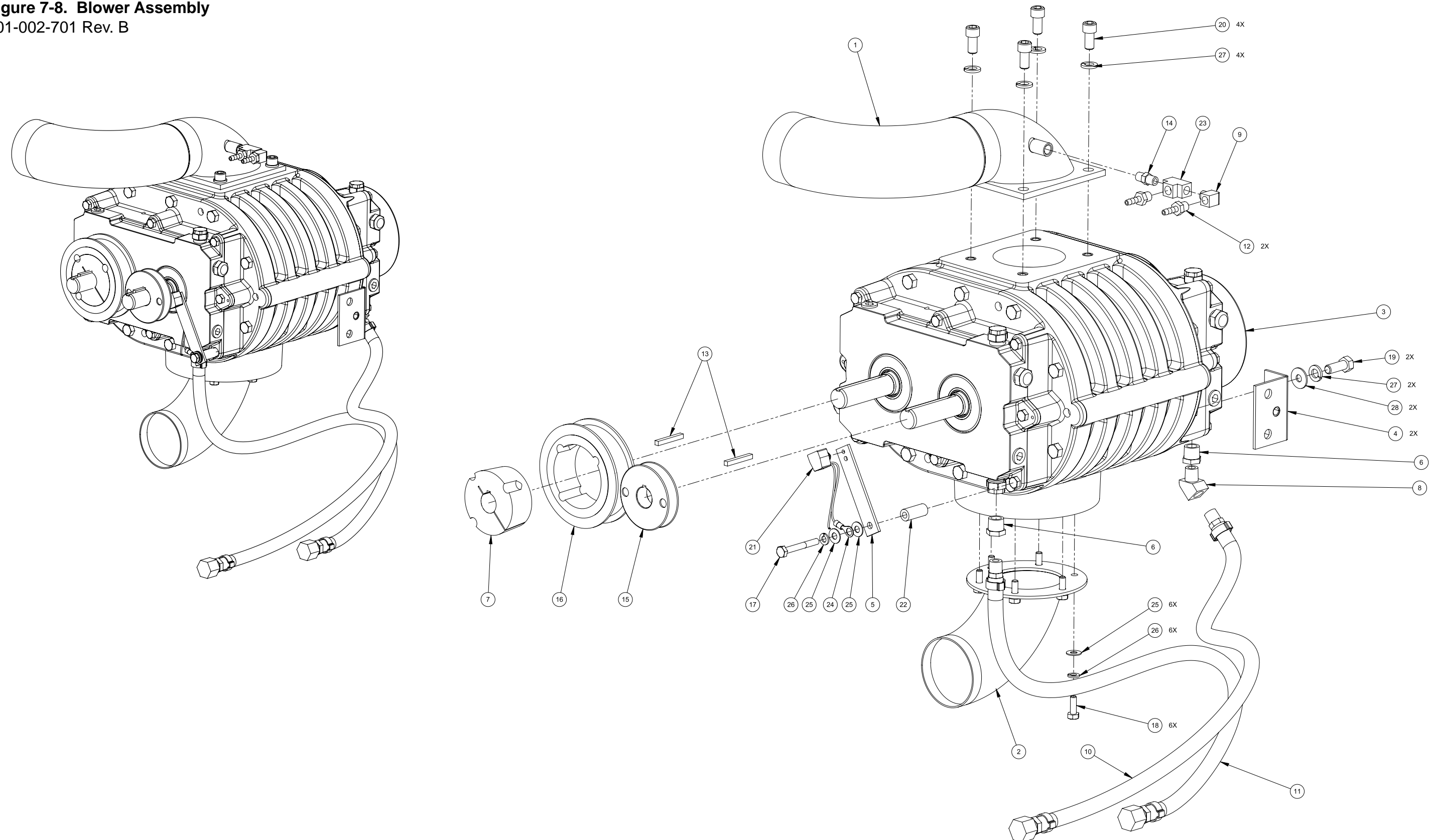


Power Pack Assembly Parts List

Item	Part Number	Description	Qty
1	601-002-701	Assembly, Blower	1
2	601-007-741	Assembly, Pump	1
3	601-001-701	Assembly, Universal CDS Frame	1
4	000-010-065	Belt, #9345 Pump Drive	1
5	000-010-052	Belt, Polychain GT	1
6	000-020-019	Bushing, #H X 7/8" Bore	1
7	000-033-132	Clamp, 1-1/2" T-Bolt	2
8	000-068-763	Hose, 1" Suction X 83" Lg	1
9	000-068-644	Hose, 5/16" PTFE (Teflon) X 49.5" Lg. w/JIC Ends	2
10	000-094-010	Nut, 1/4"-20UNC Hex	1
11	000-094-012	Nut, 5/16-18"UNC Hex	2
12	000-108-065	Protector, Pump Belt Shield - Coated	1
13	000-108-109	Protector, Pump Drive Belt - Coated	1
14	000-109-043	Pulley, AK51H	1

Item	Part Number	Description	Qty
15	000-143-141	Screw, 1/4"-20UNC X 1/2" Lg. Whiz Lock	2
16	000-143-018	Screw, 3/8"-16UNC X 1" Lg. Hex Head - Grade 8	2
17	000-143-096	Screw, 3/8"-16UNC X 1.00" Lg. Hex Head	2
18	000-143-098	Screw, 3/8-16 X 2 1/2" Hex Head	1
19	000-143-013	Screw, 5/16"-18UNC X 1.00" Lg. Hex Head Grade 8	4
20	000-143-012	Screw, 5/16"-18UNC X 3/4" Lg.	4
21	000-174-003	Washer, 1/4" Flat	2
22	000-174-002	Washer, 1/4" Flat	6
23	000-174-019	Washer, 1/4" Lock	3
24	000-174-021	Washer, 3/8" Lock	3
25	000-174-057	Washer, 3/8" Lock	2
26	000-174-004	Washer, 5/16" Flat	6
27	000-174-018	Washer, 5/16" Lock	8

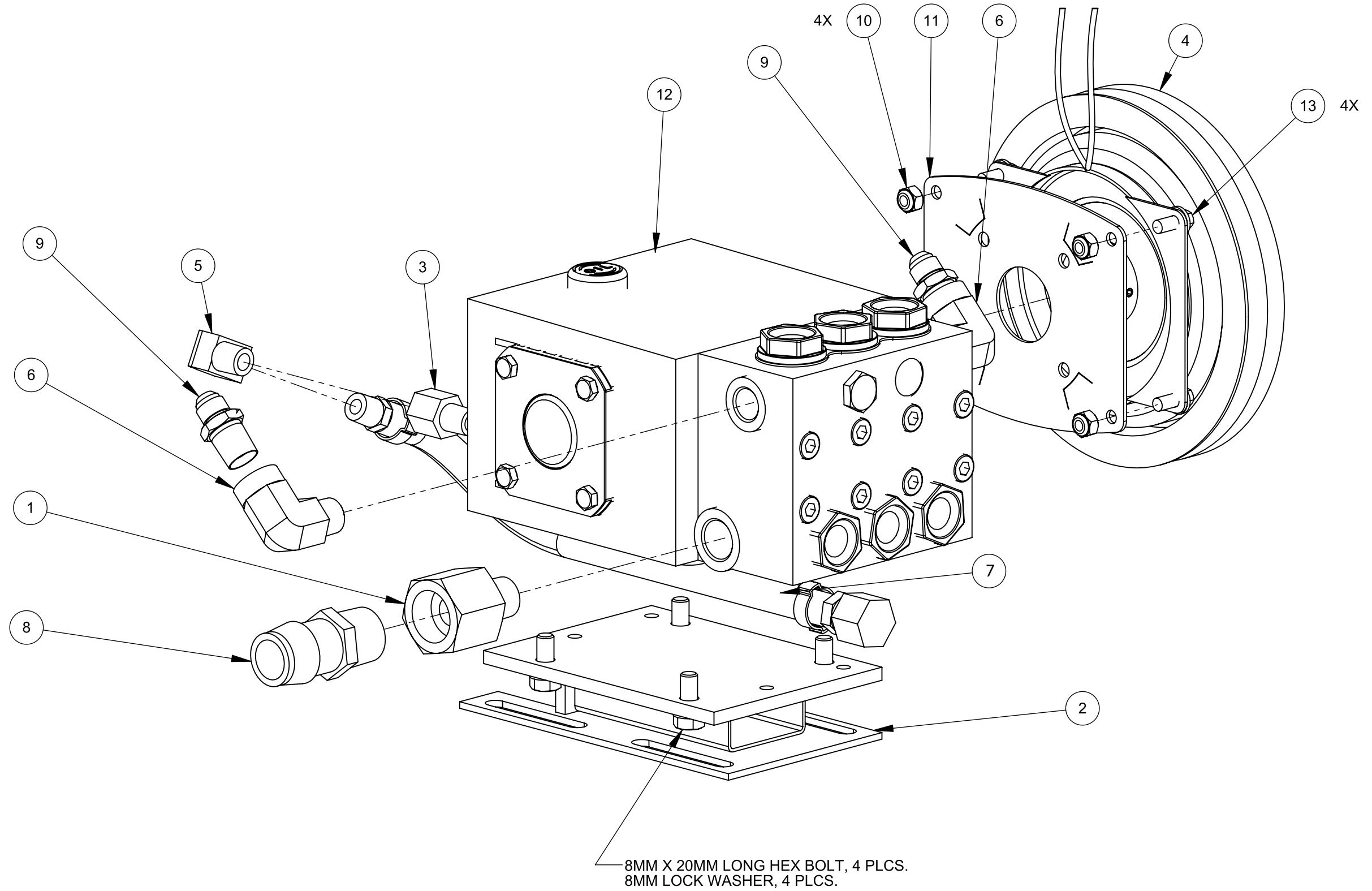
Figure 7-8. Blower Assembly
601-002-701 Rev. B



Blower Assembly Parts List

Item	Part Number	Description	Qty	Item	Part Number	Description	Qty
1	000-001-090	Adapter, Blower Inlet - Coated	1	15	000-109-009	Pulley, 2 3/4" X 7/8" Pump Drive - Machined	1
2	000-001-042	Adapter, Blower Outlet - Coated	1	16	000-109-057	Pulley, 40 Tooth GT2 8MX-10S-21 Engine and Blower	1
3	000-111-147	Blower, 4007 Dominator	1	17	000-143-373	Screw, 1/4"-20UNC X 2" Lg. Hex Head Grade 5	1
4	000-015-801	Bracket, Blower Mounting - Coated	2	18	000-143-001	Screw, 1/4"-20UNC X 3/4" Lg. Hex Head	6
5	000-015-930	Bracket, Tach. Magnetic Extension - Coated	1	19	000-143-018	Screw, 3/8"-16UNC X 1" Lg. Hex Head - Grade 8	2
6	000-052-061	Bushing, 3/8" NPT X 1/4" FPT	2	20	000-143-094-1	Screw, 3/8"-16UNC X 3/4" Lg. Socket Head	4
7	000-020-020	Bushing, 7/8" Taper-Lock	1	21	000-149-010	Sensor, CDS Magnetic Tach	1
8	000-052-082	Elbow, 1/4" NPT Street X 45 Degree	1	22	000-154-153	Spacer, Tach, Sensor	1
9	000-052-084	Elbow, 1/8" NPT Street	1	23	000-052-092	Tee, 1/8" FPT	1
10	000-068-149	Hose, Blower Oil Drain	1	24	000-037-015	Terminal, 5/16 Ring-16 AWG	1
11	000-068-149	Hose, Blower Oil Drain	1	25	000-174-003	Washer, 1/4" Flat	8
12	000-052-293	Insert, #23 (1/8" NPT X 3/16" Barb)	2	26	000-174-019	Washer, 1/4" Lock	7
13	000-077-011	Key, 3/16" X 1 1/2" Long	2	27	000-174-021	Washer, 3/8" Lock	6
14	000-052-069	Nipple, 1/8" NPT Hex	1	28	000-174-004	Washer, 5/16" Flat	2

Figure 7-9. Pump Assembly
601-007-741 Rev. E



Pump Assembly Parts List

Item	Part Number	Description	Qty
1	000-001-109	Adapter, 1/2 X 3/4 NPT S/S	1
2	000-015-927	Bracket, Compressor Mount - Coated	1
3	000-052-062	Bushing, 1/4" NPT Male X 1/4" NPT Female	1
4	000-036-008	Clutch, 7" O.D. 24mm Single Groove	1
5	000-052-085	Elbow, 1/4" NPT Street	1
6	000-052-747	Elbow, 3/8 S/S Street 90	2
7	000-068-149	Hose, CDS Blower Oil Drain	1

Item	Part Number	Description	Qty
8	000-052-125	Insert, 3/4" X 1" Hose Barb	1
9	000-052-507	Nipple, 3/8" NPT X 9/16"-18 37 Degree JIC S/S	2
10	000-094-071	Nut, 1/4"-20UNC Nylock	4
11	000-105-550	Plate, Pump Clutch	1
12	000-111-159	Pump, S/S	1
13	000-143-141	Screw, 1/4"-20UNC X 1/2" Lg. Whiz Lock	4

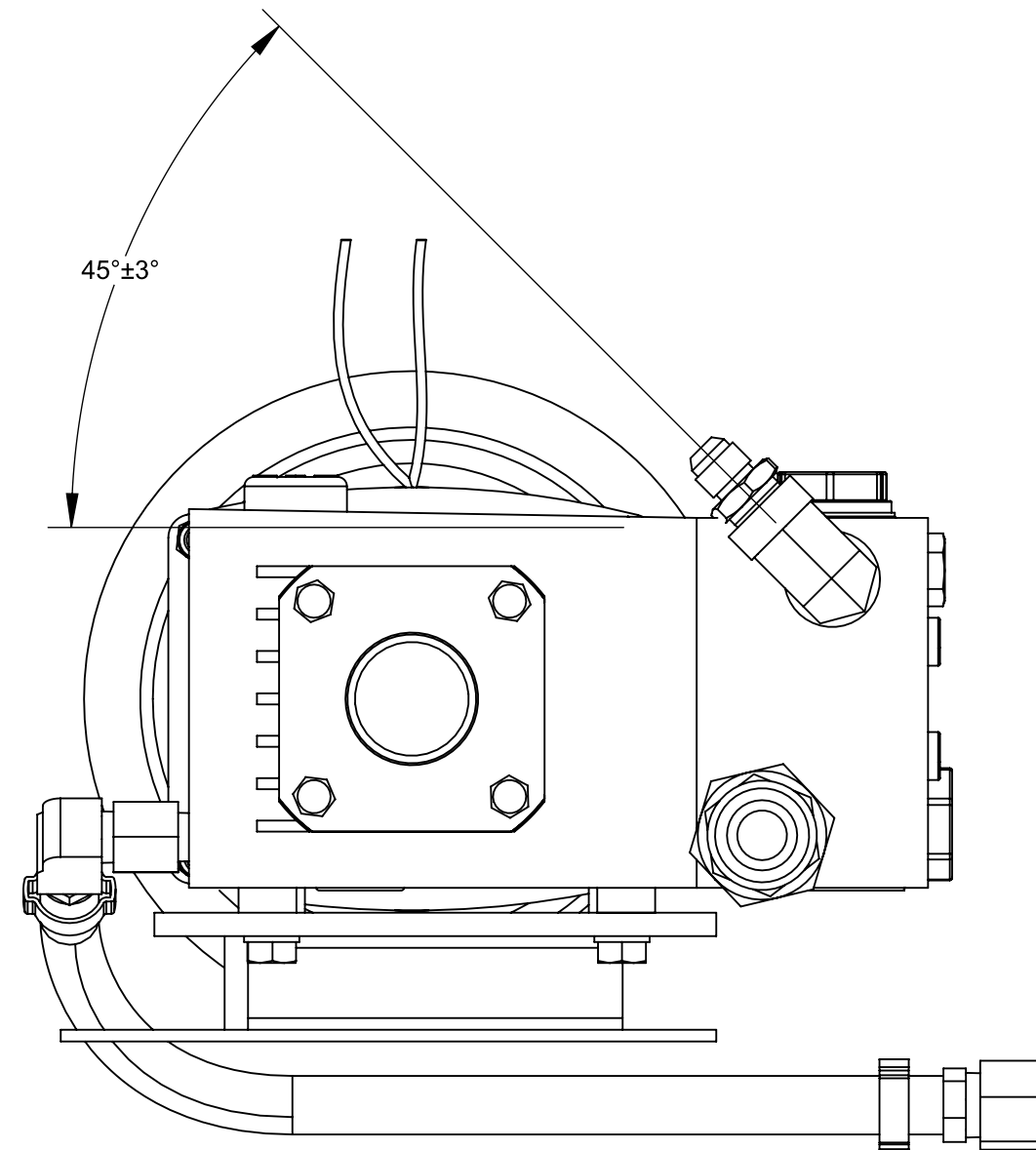
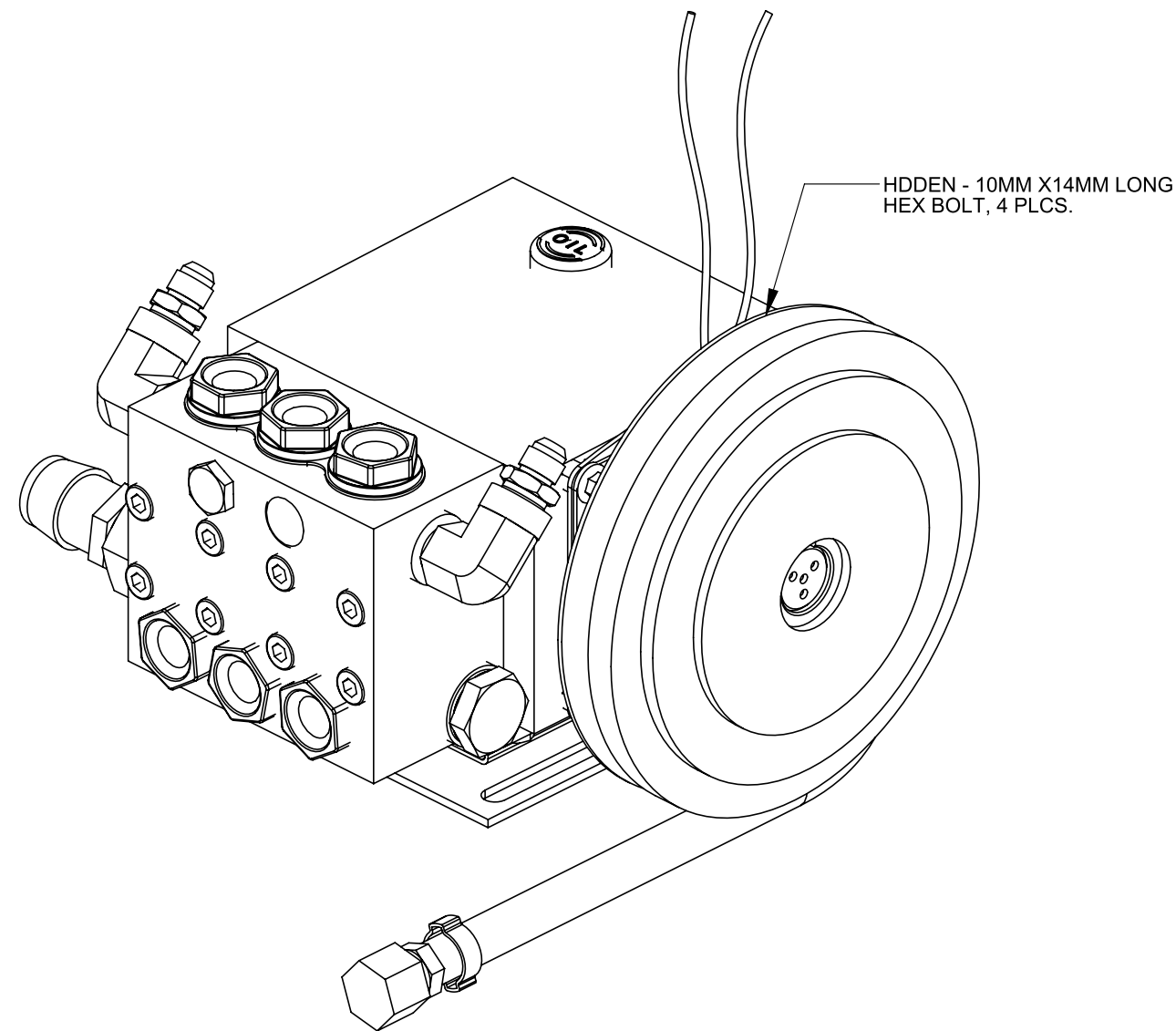
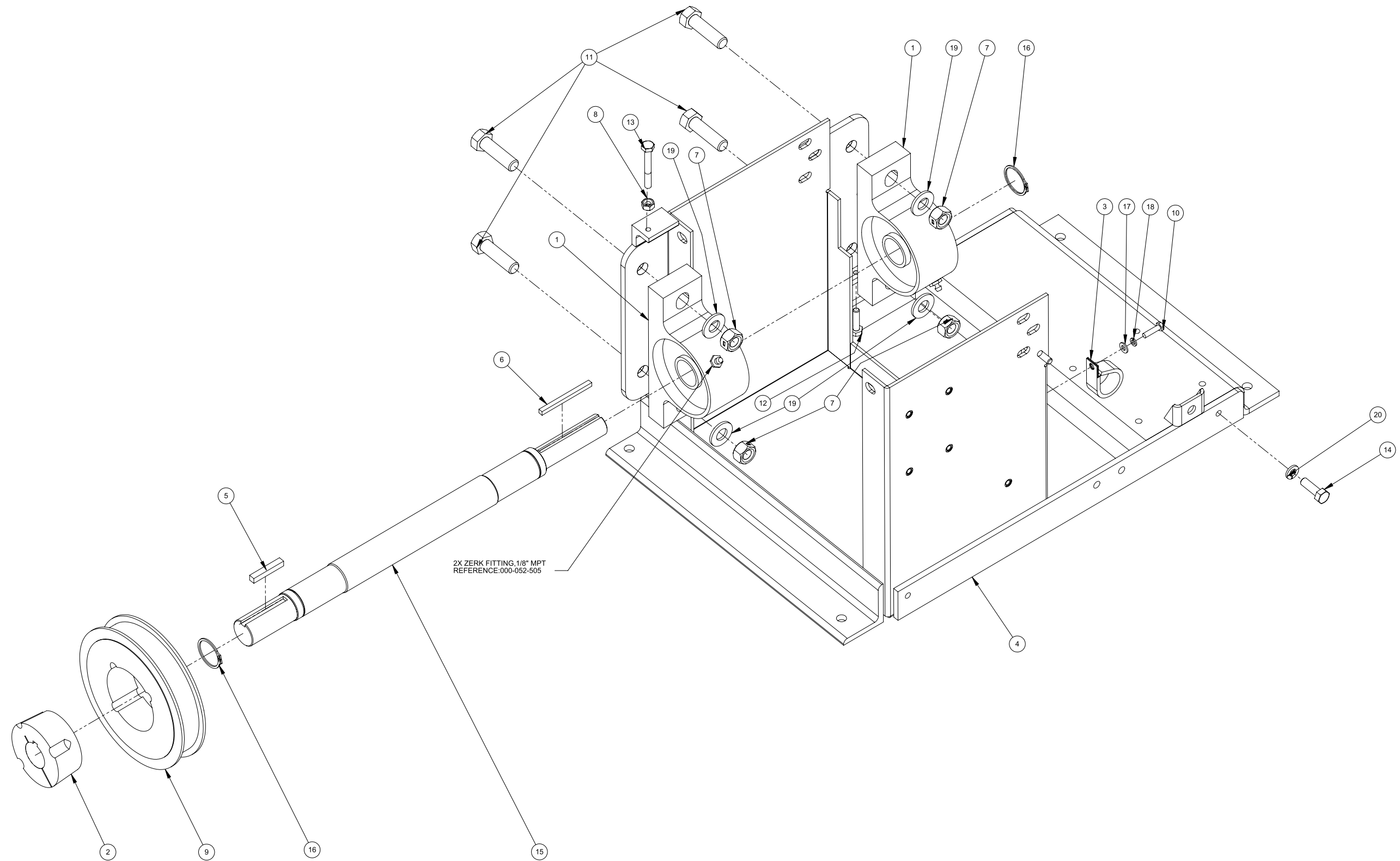


Figure 7-10. Frame Assembly
601-001-701 Rev. B

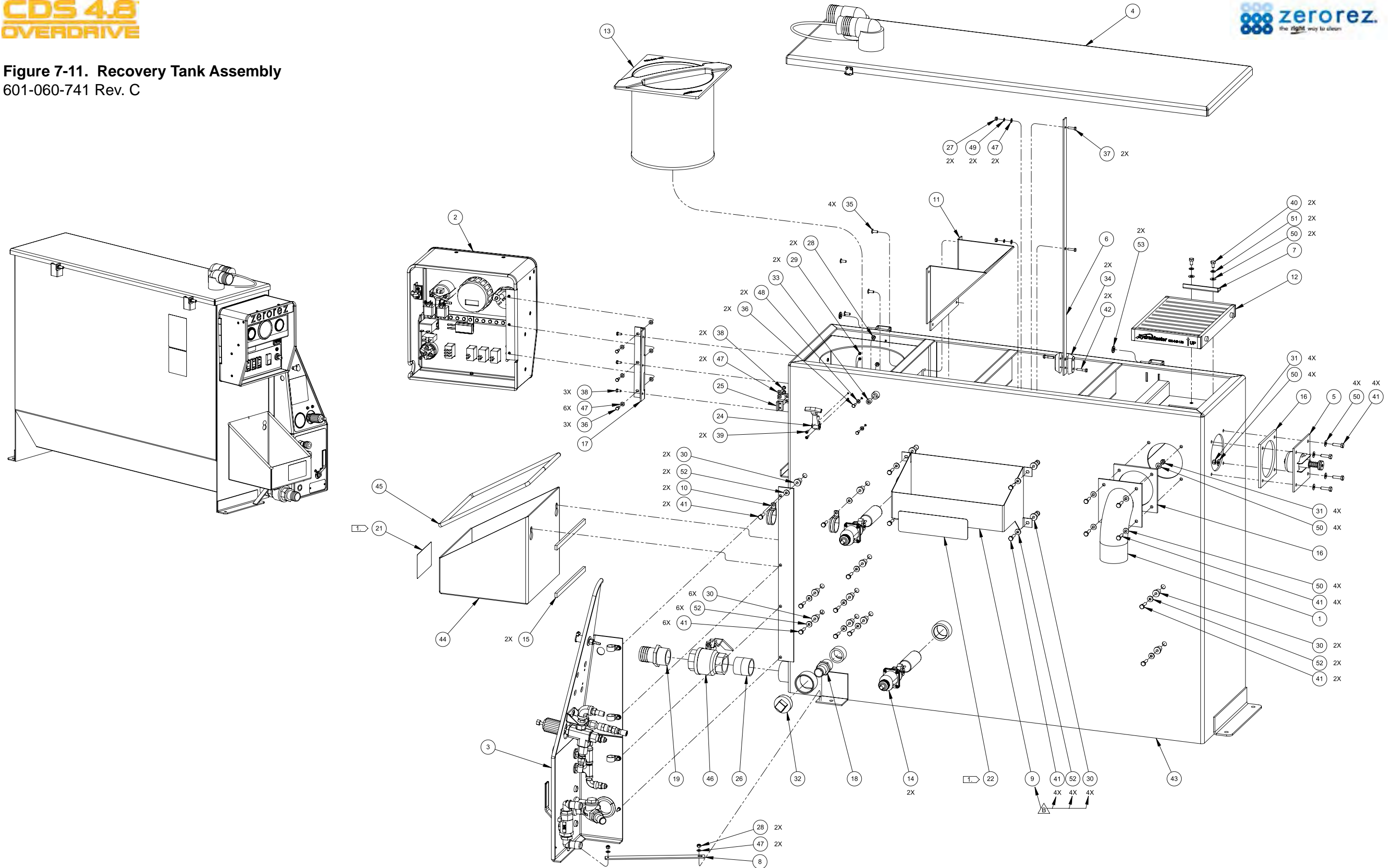


Frame Assembly Parts List

Item	Part Number	Description	Qty
1	000-008-020	Bearing, Pillow Block - 1-3/16" Bore	2
2	000-020-026	Bushing, 1-1/8" Taper-Lock	1
3	000-033-057	Clamp, 1" Cushion Loop	1
4	000-055-028	Frame, Pump and Blower - Coated	1
5	000-077-010	Key, 1/4" X 1-1/2" Lg. Class 2 Fit	1
6	000-077-012	Key, 3/16" X 2.5" Lg. Class 2 Fit	1
7	000-094-037	Nut, 1/2-13UNC 2-Way Locking	4
8	000-094-010	Nut, 1/4"-20UNC Hex	1
9	000-109-058	Pulley, Engine and Blower	1
10	000-143-132	Screw, #10-24UNC X 0.75" Lg. Hex Head	1

Item	Part Number	Description	Qty
11	000-143-240	Screw, 1/2"-13UNC X 1.75" Lg. Hex Head - Grade 5	4
12	000-143-002	Screw, 1/4"-20UNC X 1.00" Lg. Hex Head	1
13	000-143-548	Screw, 1/4"-20UNC X 2.00" Lg. Hex Head	1
14	000-143-013	Screw, 5/16"-18UNC X 1.00" Lg. Hex Head Grade 8	1
15	000-150-040	Shaft, Drive Sprocket	1
16	000-139-021	Snap Ring, 1-3/16" Shaft	2
17	000-174-001	Washer, #10 Flat	1
18	000-174-014	Washer, #10 Lock	1
19	000-174-012	Washer, 1/2 SAE H/D	4
20	000-174-018	Washer, 5/16" Lock	1

Figure 7-11. Recovery Tank Assembly
601-060-741 Rev. C

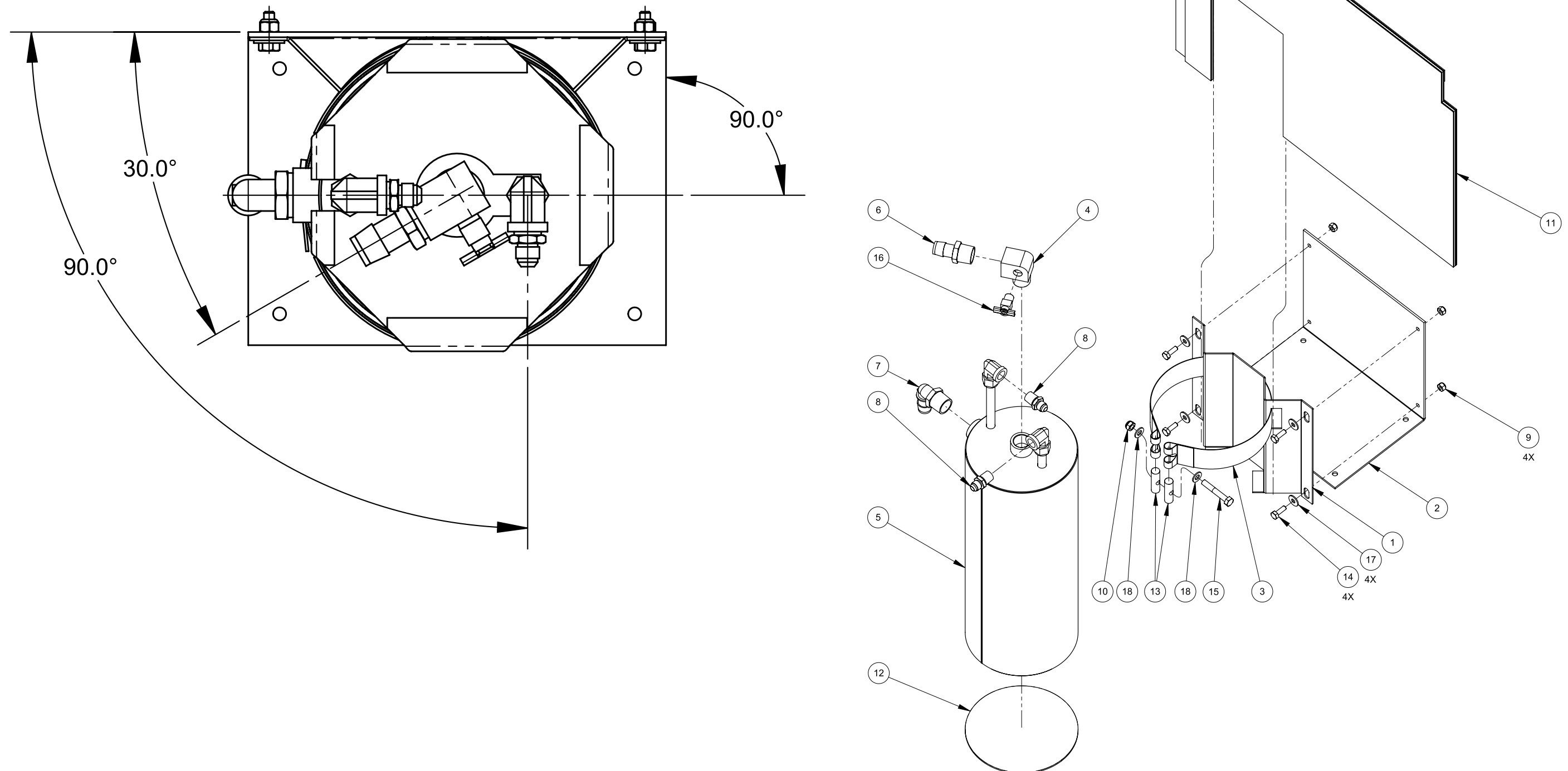


Recovery Tank Assembly Parts List

Item	Part Number	Description	Qty
1	000-001-135	Adapter, Ø3.0 Tank to X 90 Degree Blower Hose	1
2	601-018-741	Assembly, Dash Box	1
3	601-019-741	Assembly, Instrument Panel	1
4	601-029-701	Assembly, Recovery Tank Cover	1
5	610-026-724	Assembly, Vacuum Relief Valve - URT	1
6	000-015-423	Bracket, Anode - Fabricated	1
7	000-015-932	Bracket, Flat Filter Securing - Uncoated	1
8	000-015-1208	Bracket, Instrument Panel to Vacuum Tank Stabilizer	1
9	000-015-422	Bracket, Tray - Coated	1
10	000-033-053	Clamp, 1-1/2" Cushion Loop	2
11	000-049-154	Filter, Air Deflector, URT - Fabricated	1
12	000-049-153	Filter, Flat - URT	1
13	000-049-152	Filter, Recovery Tank Basket	1
14	000-157-091	Float, Lever Switch	2
15	000-057-026	Gasket, 1/2" X 1/4" X 18-1/8" Lg.	2
16	000-057-206	Gasket, Adapter - URT	2
17	000-067-031	Hinge, Dash Box	1
18	000-052-758	Insert, 1" NPT X 1" Barb	1
19	000-052-226	Insert, 1-1/2" NPT X 1-1/2" Barb (Grey)	1
20	000-081-328	Label, ANSI Warning - Large	1
21	000-081-363	Label, ANSI Warning - Park Position Machine	1
22	000-081-335	Label, Large 8" X 2.375"	1
23	000-081-332	Label, Maintenance and Lube Schedule	1
24	000-086-008	Latch, Bungee	1
25	000-086-032	Latch, Dash Strike	1
26	000-052-763	Nipple, 1-1/2" IPS Close S/S	1
27	000-094-004	Nut, #10-24UNC Hex	2

Item	Part Number	Description	Qty
28	000-094-034	Nut, #10-24UNC Nylock	4
29	000-094-063	Nut, #6-32UNC Nylock	2
30	000-094-113	Nut, 1/4"-20UNC Neoprene Wellnut	14
31	000-094-009	Nut, 1/4"-20UNC Nylock	8
32	000-106-019	Plug, 1-1/2" NPT	1
33	000-106-007	Plug, 1/4" NPT Allen Head	1
34	000-108-022	Protector, Magnesium Anode - Modified	2
35	000-140-023	Rivet, AB8-6A Aluminum Pop	4
36	000-143-126	Screw, #10-24UNC X 0.50" Lg. Hex Head	5
37	000-143-132	Screw, #10-24UNC X 0.75" Lg. Hex Head	2
38	000-143-166	Screw, #10-24UNC X 3/8" Lg. Hex Head	5
39	000-143-539	Screw, #6-32UNC X 0.50" Lg. Button Head	2
40	000-143-333	Screw, 1/4"-20UNC X 0.50" Lg. Hex Head	2
41	000-143-002	Screw, 1/4"-20UNC X 1.00" Lg. Hex Head	22
42	000-143-134	Screw, 10-24 X 1" HHCS S/S	2
43	000-159-130	Tank, 100 Gallon Universal Recovery - Coated	1
44	000-166-002	Tray, Soap Jug - Coated	1
45	000-131-131	Trimlok, 3/8 X 1/8 Rubber	1 ft
46	000-169-022	Valve, 1-1/2" Full Port Ball	1
47	000-174-001	Washer, #10 Flat	12
48	000-174-036	Washer, #10 Flat Rubber Backed	2
49	000-174-014	Washer, #10 Lock	2
50	000-174-003	Washer, 1/4" Flat	18
51	000-174-019	Washer, 1/4" Lock	2
52	000-174-060	Washer, 1/4" Rubber Backed	14
53	000-174-029	Washer, 3/8" Rubber Backed	2

Figure 7-12. Coolant Heat Exchanger Assembly
601-006-741 Rev. B



Coolant Heat Exchanger Assembly Parts List

Item	Part Number	Description	Qty
1	000-015-745	Bracket, After Burner Mounting Saddle - Fabricated	1
2	000-015-971	Bracket, Coolant Heat Exchanger - Uncoated	1
3	000-033-123	Clamp, After Burner Mount - 21.125" Lg.	1
4	000-052-733	Fitting, 3/4" NPT Street Elbow - Modified	1
5	000-038-065	Heat Exchanger, Coolant - Weldment	1
6	000-052-338	Insert, #1212 (3/4" NPT X 3/4" Barb)	1
7	000-052-756	Insert, 3/4" NPT X 3/4" Elbow	1
8	000-052-507	Nipple, 3/8" NPT X 9/16"-18 37 Degree JIC S/S	2
9	000-094-009	Nut, 1/4"-20UNC Nylock	4
10	000-094-038	Nut, 5/16"-18UNC Nylock	1
11	000-108-102	Protector, Coolant Heat Exchanger	1
12	000-108-131	Protector, Heat Exchanger Pad Ø6.625	1
13	000-141-033	Rod, Heat Exchanger Strap Retainer - Fabricated	2
14	000-143-001	Screw, 1/4"-20UNC X 3/4" Lg. Hex Head	4
15	000-143-316	Screw, 5/16-18 X 2" HHCS	1
16	000-169-205	Valve, Petcock 90 Degree	1
17	000-174-002	Washer, 1/4" Flat	4
18	000-174-049	Washer, 5/16" Flat	2

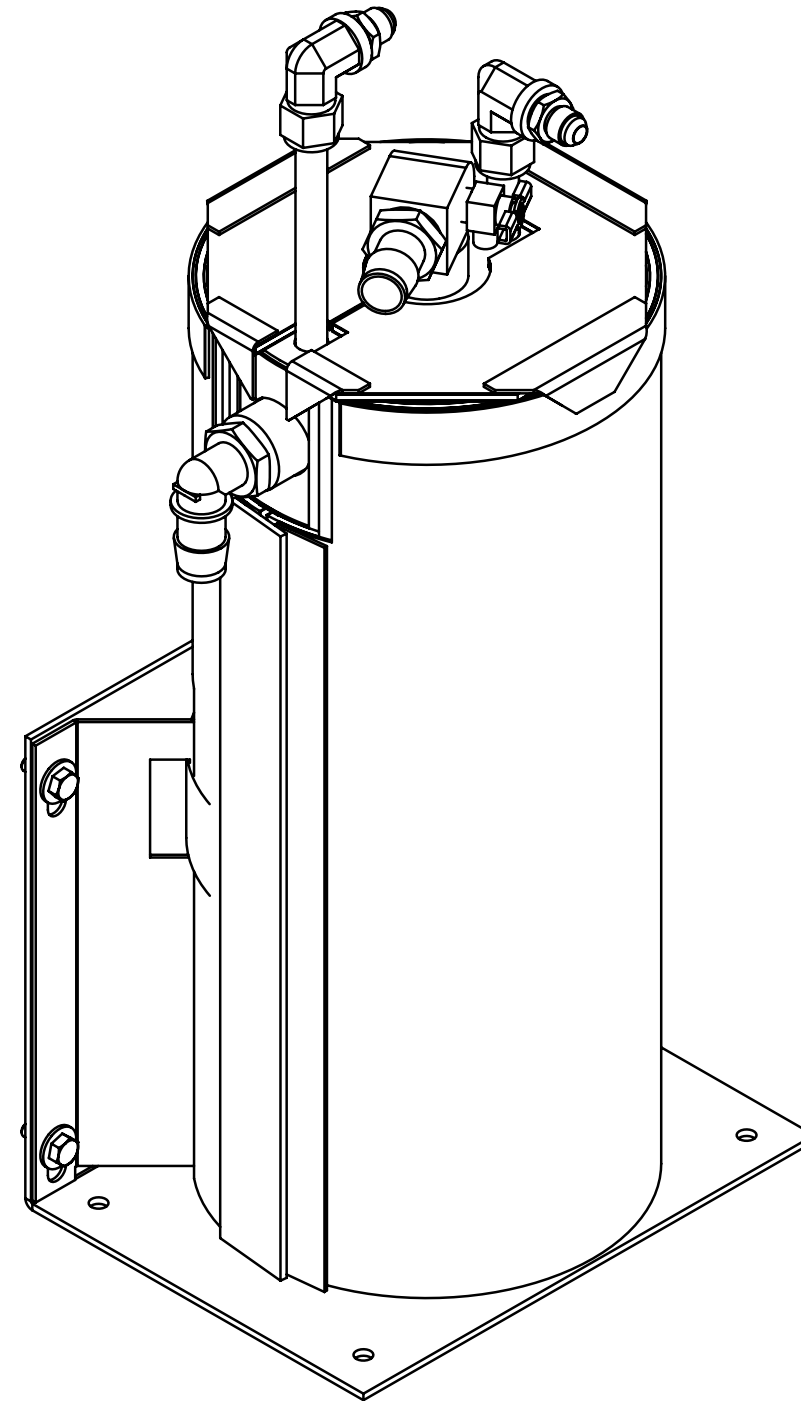
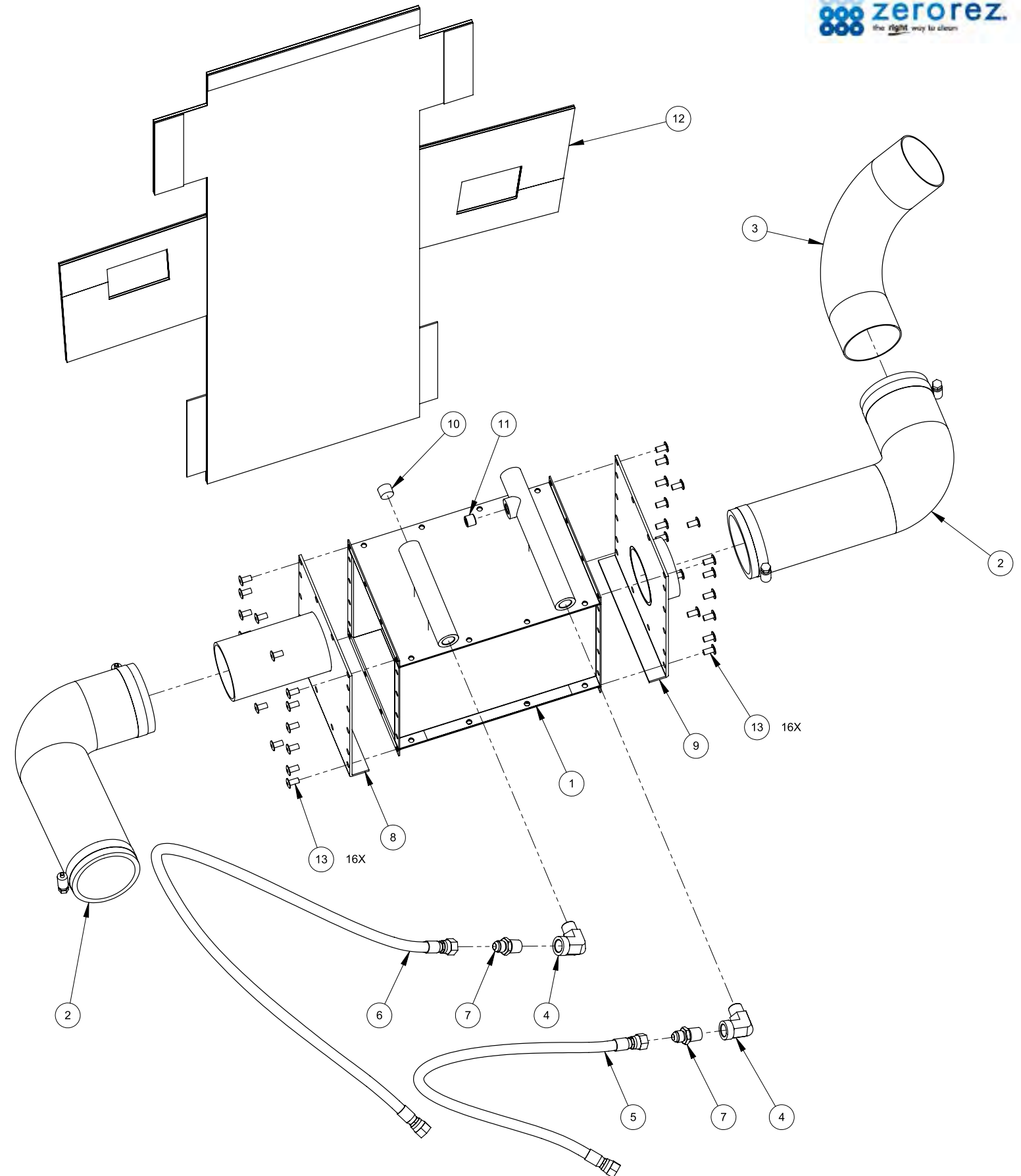
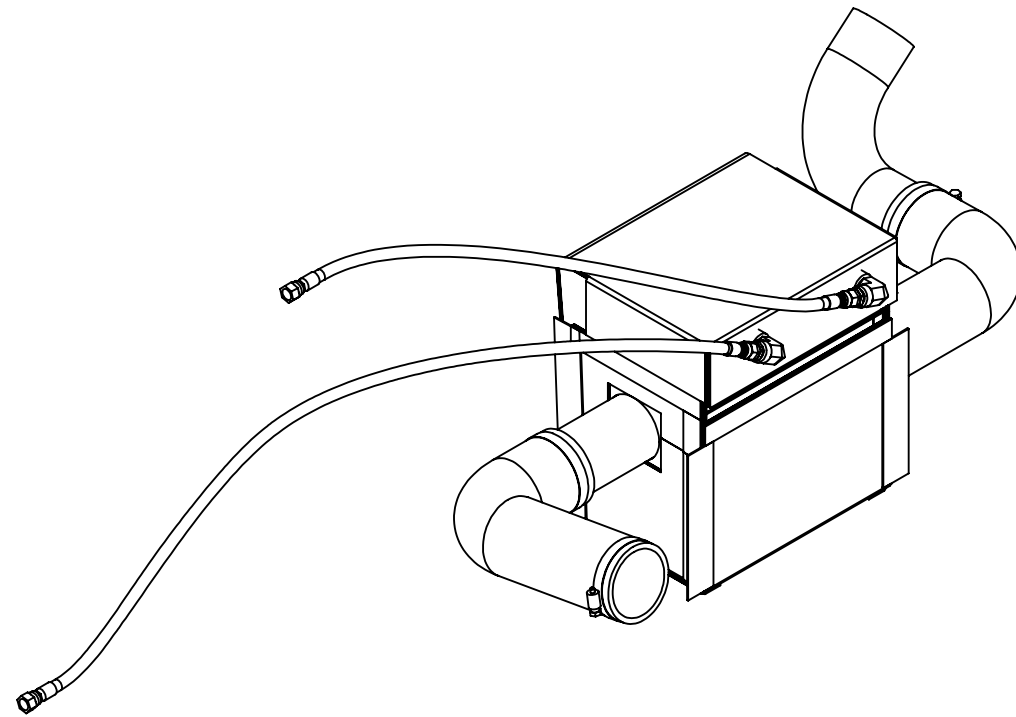


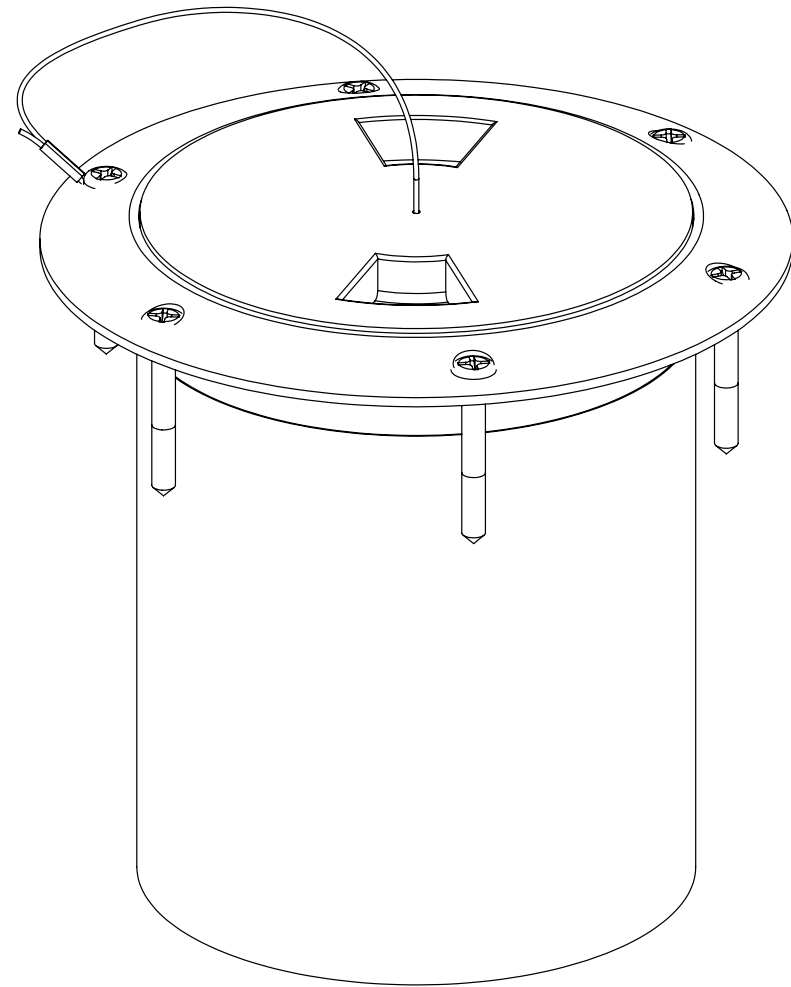
Figure 7-13. Salsa Heat Exchanger Assembly
601-005-741 Rev. D



Salsa Heat Exchanger Assembly Parts List

Item	Part Number	Description	Qty
1	000-038-071	Core, S/S Heat Exchanger 6 X 8 (8 Row)	1
2	000-052-674	Elbow, 3" Rubber w/ Clamps	2
3	000-052-649	Elbow, 3.00" O.D. X 0.065	1
4	000-052-747	Elbow, 3/8 S/S Street 90	2
5	000-068-802	Hose, 3/8" X 42" Lg. Teflon w/ 3/8" JIC Ends	1
6	000-068-802	Hose, 3/8" X 42" Lg. Teflon w/ 3/8" JIC Ends	1
7	000-052-507	Nipple, 3/8" X 9/16"-18 37 Degree JIC S/S	2
8	000-100-154	Panel, Salsa Inlet - Weldment	1
9	000-100-155	Panel, Salsa Outlet - Weldment	1
10	000-106-173	Plug, 3/8" NPT Allen Head	1
11	000-106-124	Plug, Pipe, 1/4", Flush Fitting	1
12	000-108-140	Protector, Salsa Insulation Set	1
13	000-140-021	Rivet, 1/4" Blind X 0.50" Lg.	32

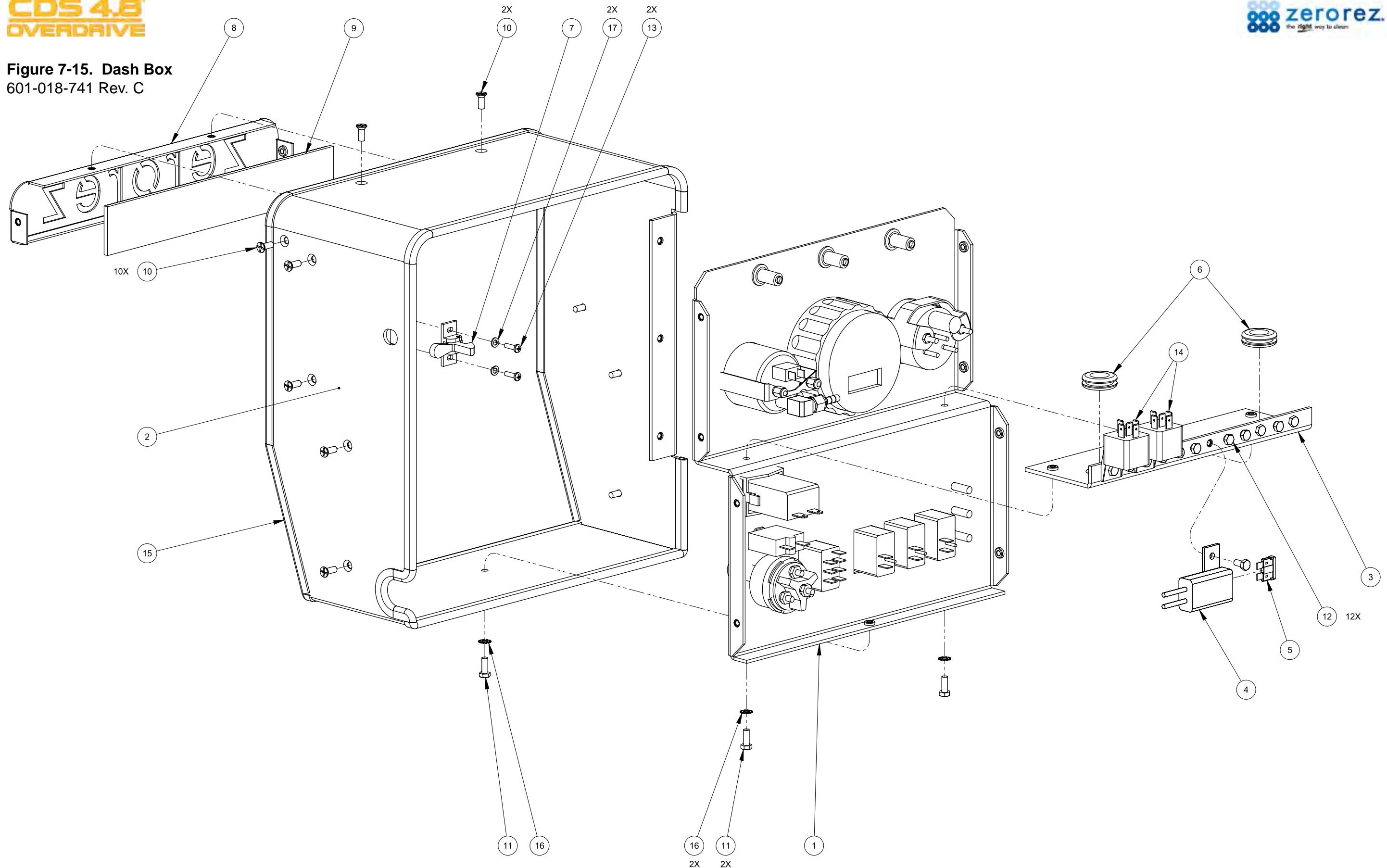
Figure 7-14. Pass Through Assembly
000-078-381 Rev. C



Pass Through Assembly Parts List

Item	Part Number	Description	Qty
1	000-025-008	Cable, 150 lb Test S/S	1
2	000-033-032	Clamp, CDS Throttle Cable	2
3	000-041-200	Cover, 4" Round Abs-Mod. -Pass Through	1
4	000-143-537	Screw, #10 X 1.5" Lg. Pan Head Sheet Metal	6
5	000-125-182	Tube, Pass Through	1

Figure 7-15. Dash Box
601-018-741 Rev. C



Dash Box Assembly Parts List

Item	Part Number	Description	Qty
1	601-020-701	Assembly, Dash Panel	1
2	000-013-025	Box, Dash - Coated	1
3	000-015-183	Bracket, Grounding Bus - Fabricated	1
4	000-056-006	Fuse Holder, In-Line - Weatherproof	1
5	000-056-003	Fuse, 15 Amp Plug In	1
6	000-060-002	Grommet, Large Wiring	2
7	000-086-104	Latch, Dash Securing	1
8	000-105-053-10	Plate, Dash Name - Coated	1
9	000-084-016	Reflector, 1.625" X 10.25"	1
10	000-143-114	Screw, #10-24UNC X 0.50" Lg. Flat Head Phillips	12
11	000-143-126	Screw, #10-24UNC X 0.50" Lg. Hex Head	3
12	000-143-166	Screw, #10-24UNC X 3/8" Lg. Hex Head	12
13	000-143-046	Screw, #6-32 X .500" Lg. PHP	2
14	000-157-022	Switch, Relay	2
15	000-131-027	Trimlok, 1/8" I.D. X 3/8" X 105" Lg	1 ft
16	000-174-015	Washer, #10 Outside Star	3
17	000-174-043	Washer, #6 Lock	2

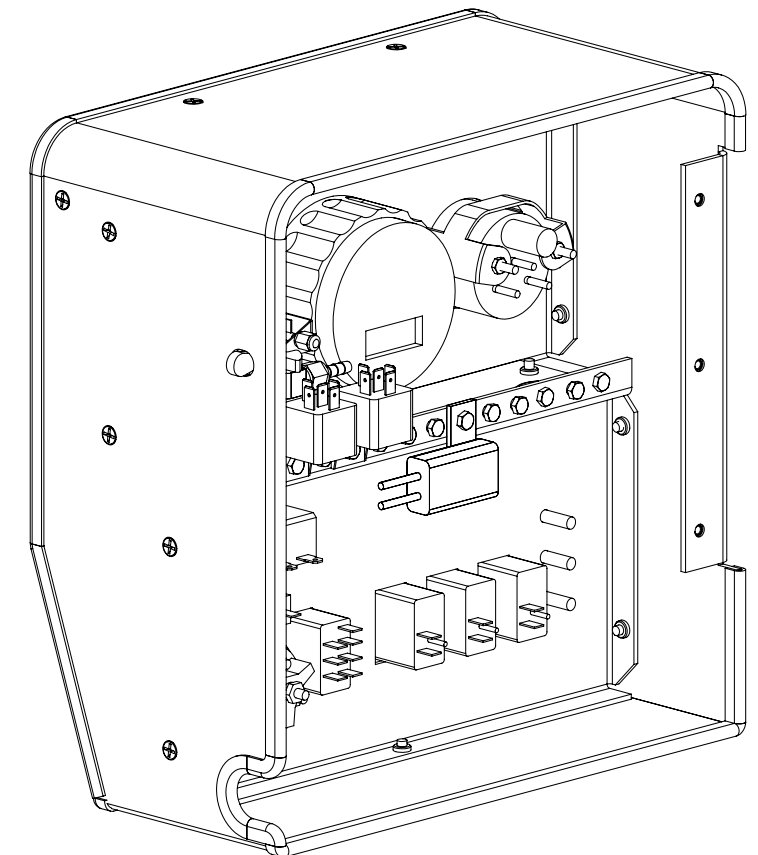
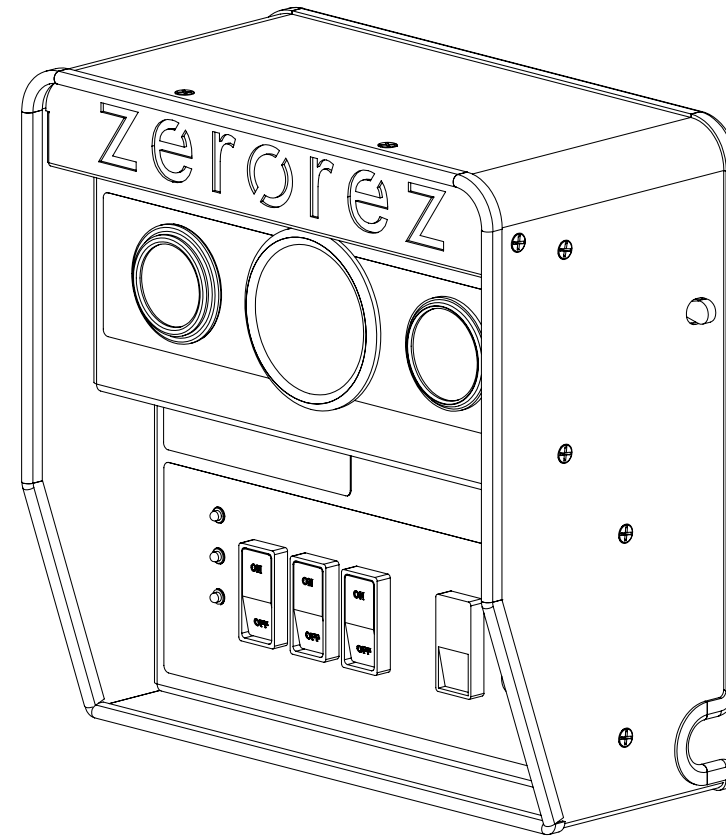
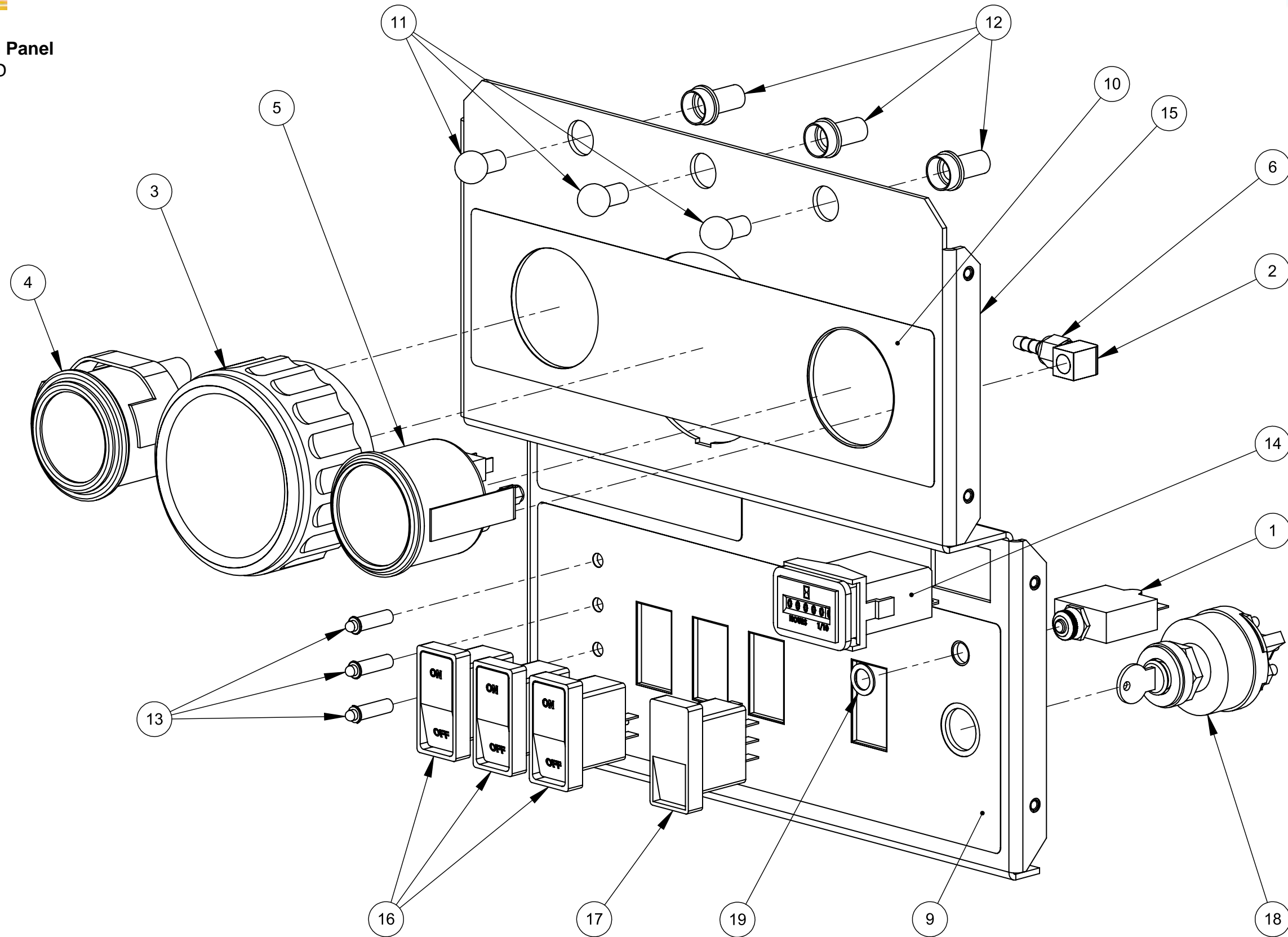
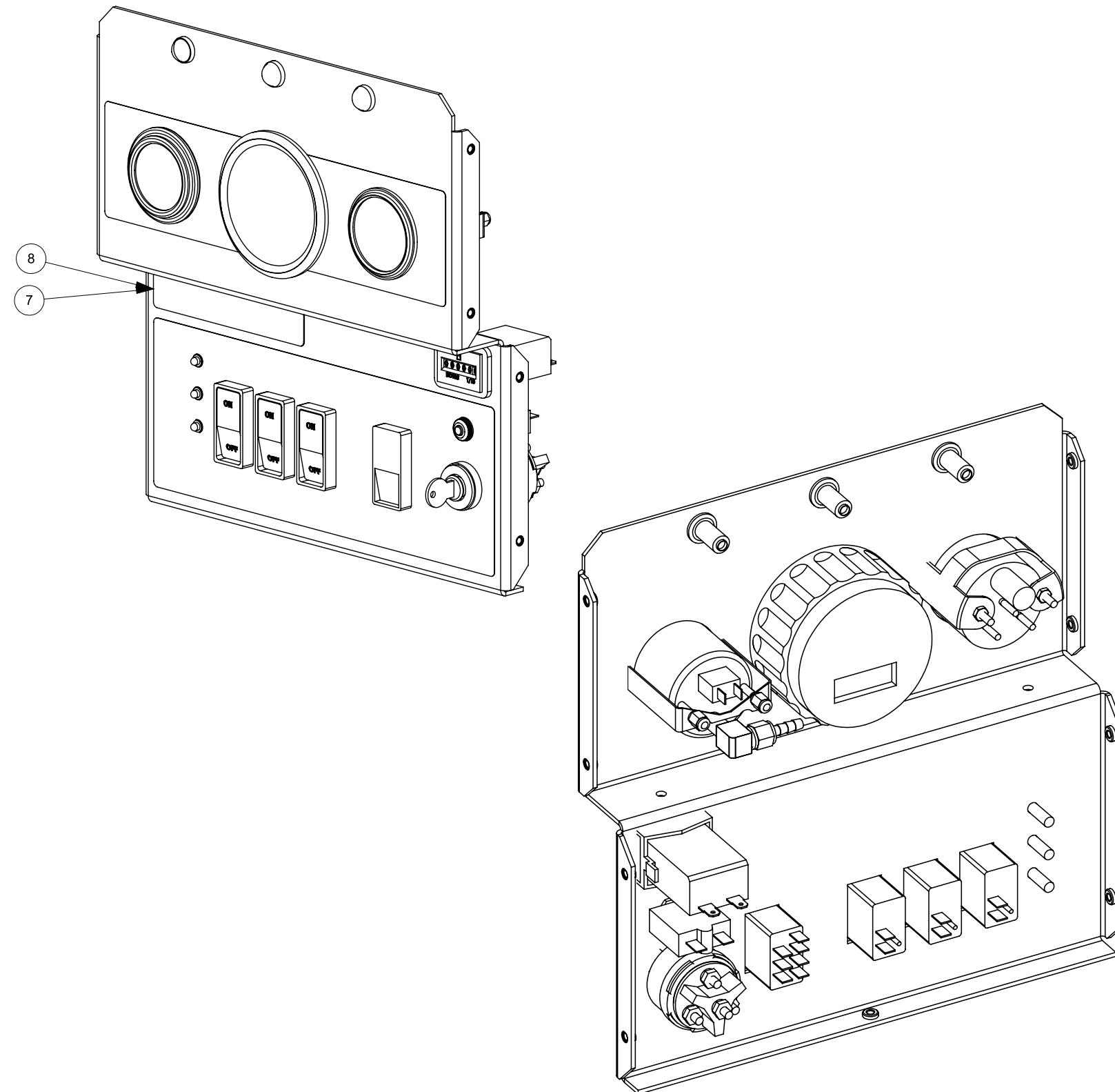


Figure 7-16. Dash Panel
601-020-701 Rev. D

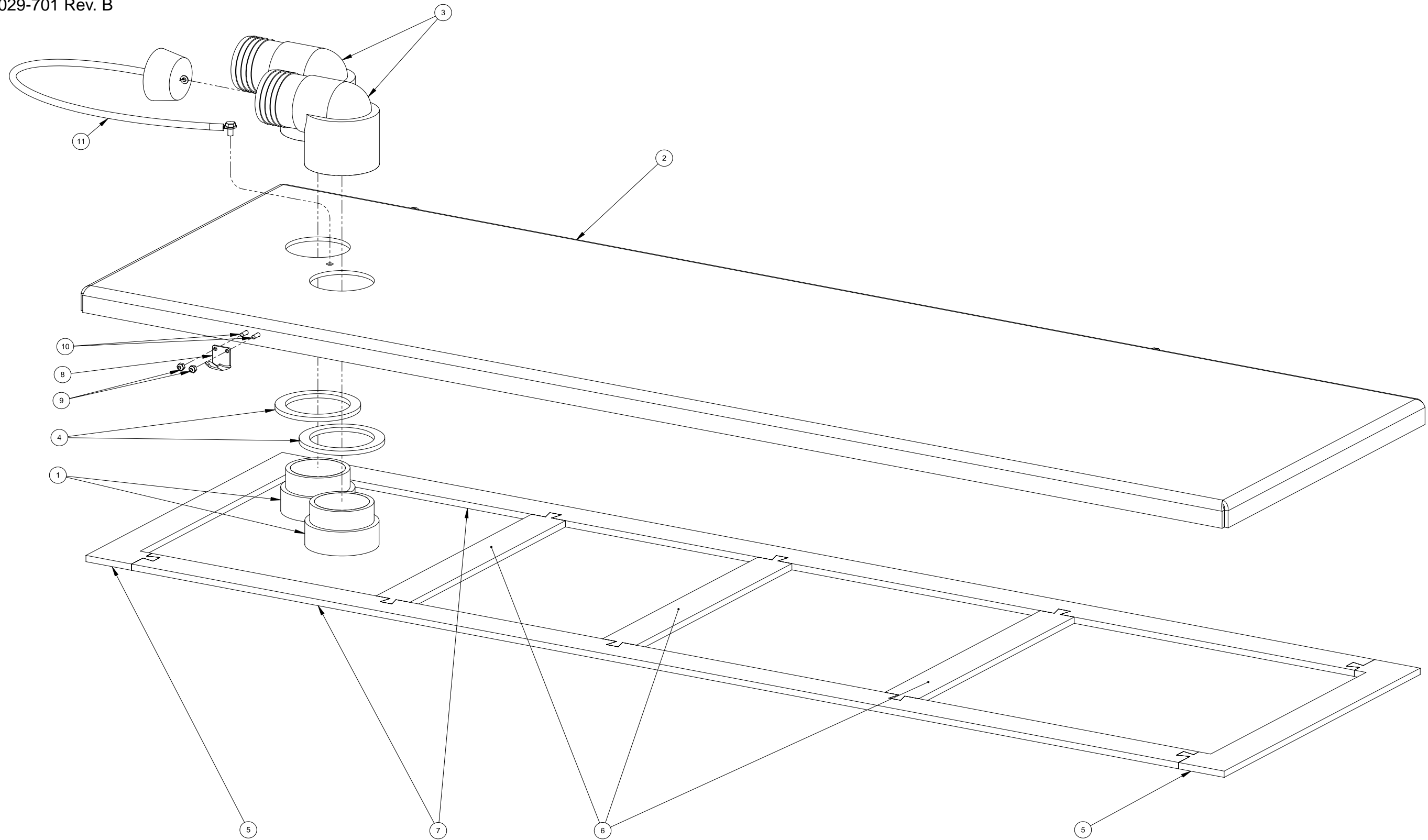


Dash Panel Assembly Parts List



Item	Part Number	Description	Qty
1	000-018-004	Breaker, 25 Amp Circuit	1
2	000-052-084	Elbow, 1/8" NPT Street	1
3	000-074-034	Gauge, Tach. Mag Pick Up 3-3/8" Dial	1
4	000-074-016	Gauge, Temperature	1
5	000-074-006	Gauge, Vacuum	1
6	000-052-096	Insert, #F23 (1/8" FPT X 3/16" Barb)	1
7	000-081-355	Label, Dash Name - CDS 1	1
8	000-081-356	Label, Dash Name - CDS 2	1
9	000-081-353	Label, Lower Dash	1
10	000-081-354	Label, Upper Dash	1
11	000-084-004	Lamp, Replacement Gauge	3
12	000-084-009	Lamp, Socket - Dashboard	3
13	000-084-011	Light, Red LED Indicator Mini	3
14	000-074-170	Meter, Rectangular w/o Bezel	1
15	000-100-071	Panel, Dash - Coated	1
16	000-157-040	Switch, 20 Amp Rocker	3
17	000-157-131	Switch, 3-Way Speed Control	1
18	000-157-008	Switch, Ignition	1
19	000-174-052	Washer, 3/8" Flat	1

Figure 7-17. Recovery Tank Cover Assembly
601-029-701 Rev. B

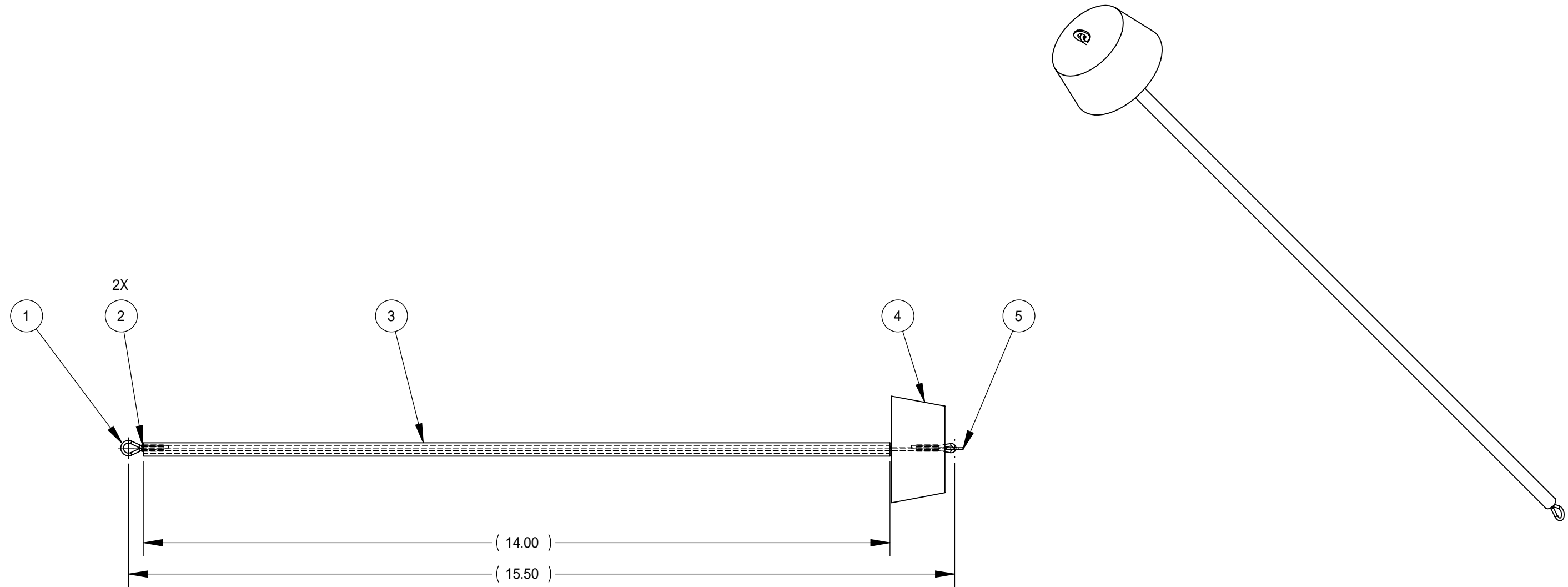


Recovery Tank Cover Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-219	Adapter, 2" NPT X 2" F Slip	2
2	000-041-447	Cover, 100 Gal. URT - Coated	1
3	000-052-222	Elbow, 2" Barb X 2" FPT	2
4	000-057-015	Gasket, 1-1/2" Bulkhead Fitting	2
5	000-057-202	Gasket, End - Rec. Tank Cover	2
6	000-057-203	Gasket, Middle - Rec. Tank Cover	3

Item	Part Number	Description	Qty
7	000-057-205	Gasket, Side - Rec. Tank Cover	2
8	000-086-008	Latch, Bungee - Strike (Part of 000-086-008)	1
9	000-094-063	Nut, #6-32UNC Nylock	2
10	000-143-539	Screw, #6-32UNC X 0.50" Lg. Button Head	2
11	000-078-039	Vacuum Inlet Stopper	1

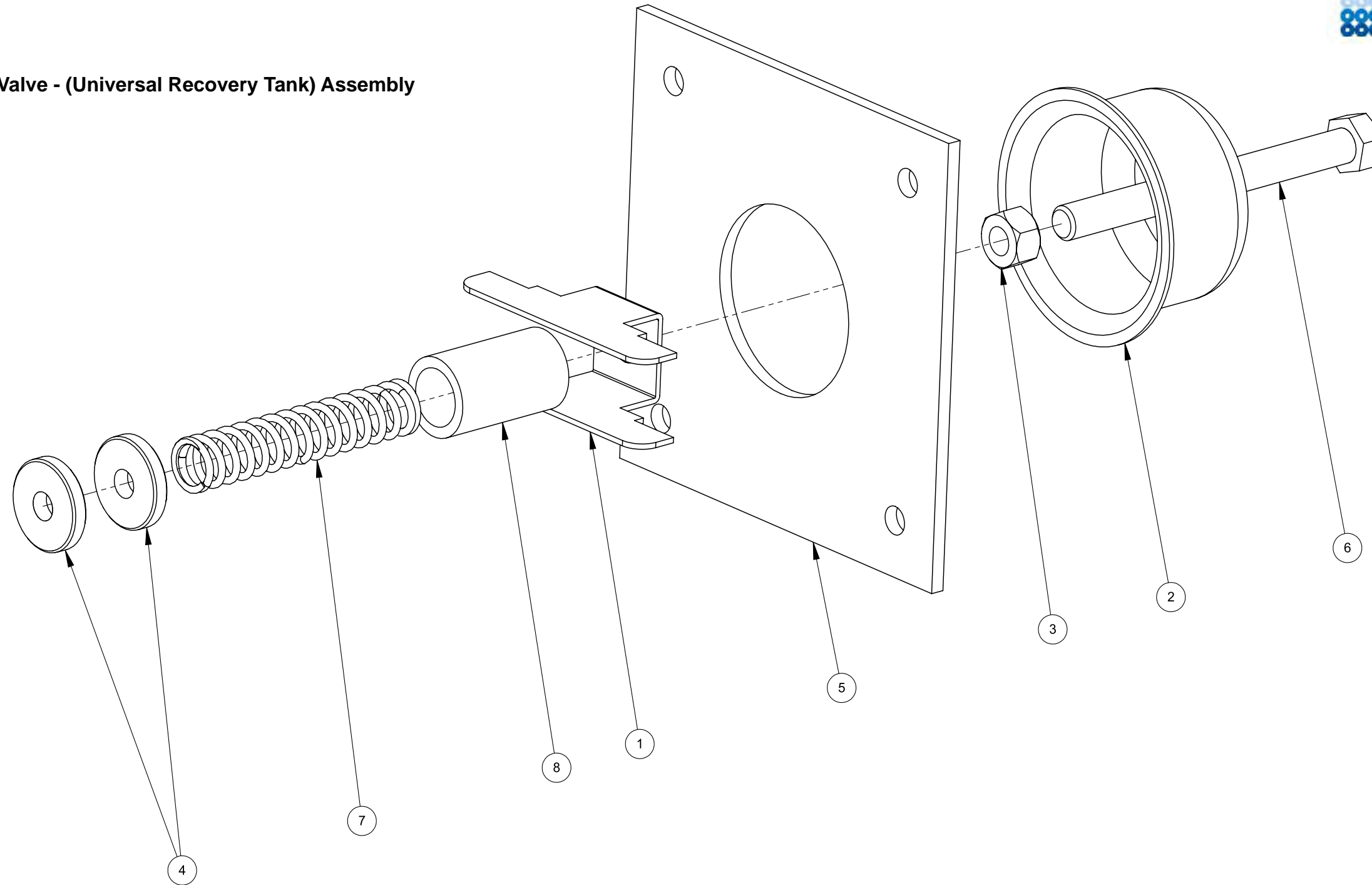
Figure 7-18. Vacuum Inlet Stopper Kit Assembly
000-078-039 Rev. B



Vacuum Inlet Stopper Kit Parts List

Item	Part Number	Description	Qty
1	000-025-008	Cable, 150 lb. Test 17.00 Lg.	1
2	000-033-032	Clamp, Throttle Cable	2
3	000-068-025	Hose, Ø1/4" X 14.00 Lg. Clear	1
4	000-106-028	Stopper, Vacuum Inlet	1
5	000-174-045	Washer, #6 S/S Flat	1

Figure 7-19. Vacuum Relief Valve - (Universal Recovery Tank) Assembly
610-026-724 Rev. B

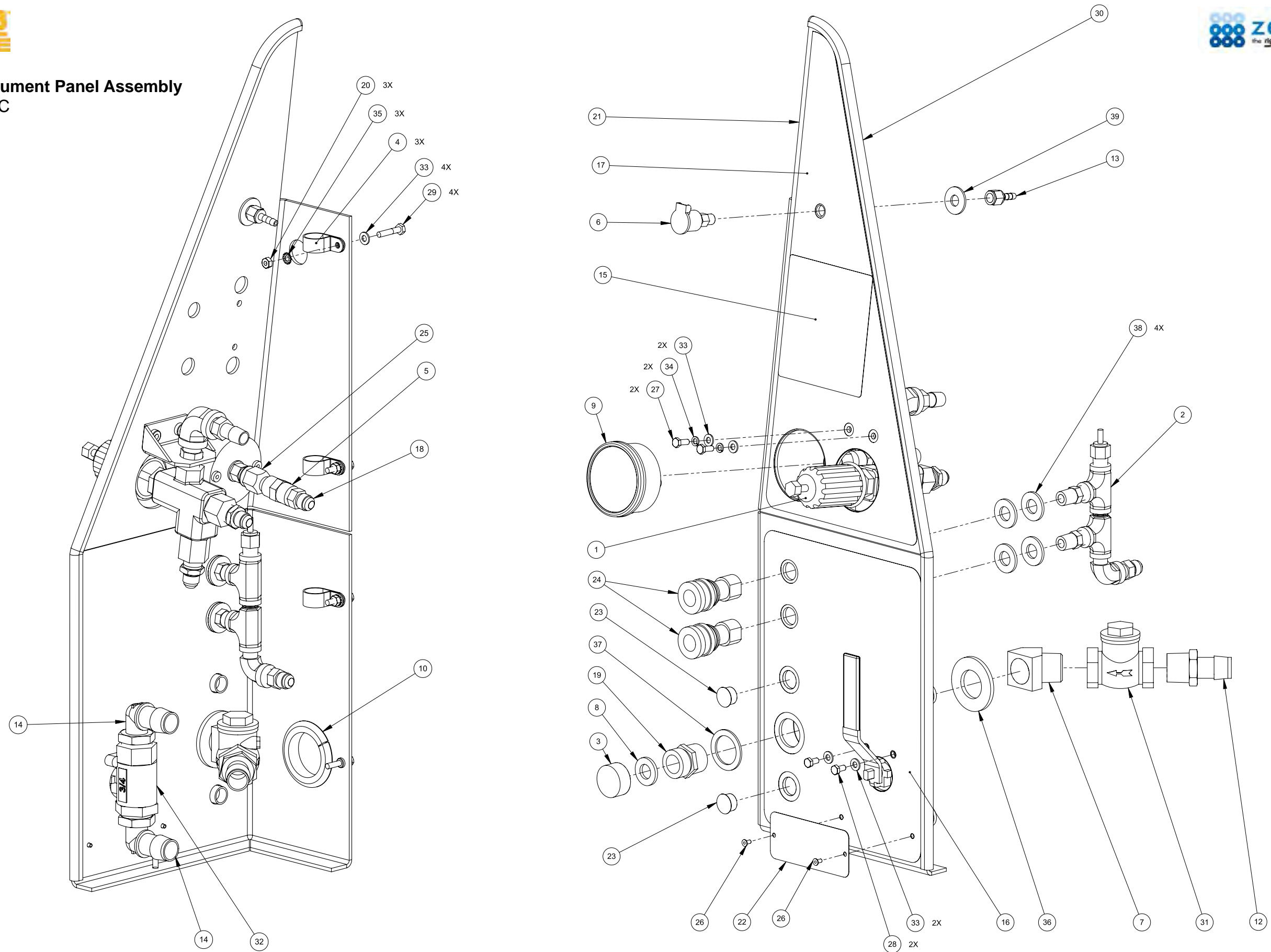


Vacuum Relief Valve - (Universal Recovery Tank) Assembly Parts List

Item	Part Number	Description	Qty
1	000-015-182	Bracket, Vacuum Relief Valve - Fabricated	1
2	000-027-032	Cap, Spun Vacuum Relief Valve	1
3	000-094-101	Nut, 3/8"-16 UNC Hex Jam	1
4	000-094-077	Nut, 3/8"-16UNC X 1.00" O.D. Knurled	2

Item	Part Number	Description	Qty
5	000-105-332	Plate, Vacuum Relief Valve Mounting - Coated	1
6	000-143-198	Screw, 3/8"-16UNC X 4" Lg. Hex Head - Full Thread	1
7	000-155-026	Spring, Vacuum Relief Valve	1
8	000-125-111	Tube, Vacuum Relief Spring Guide	1

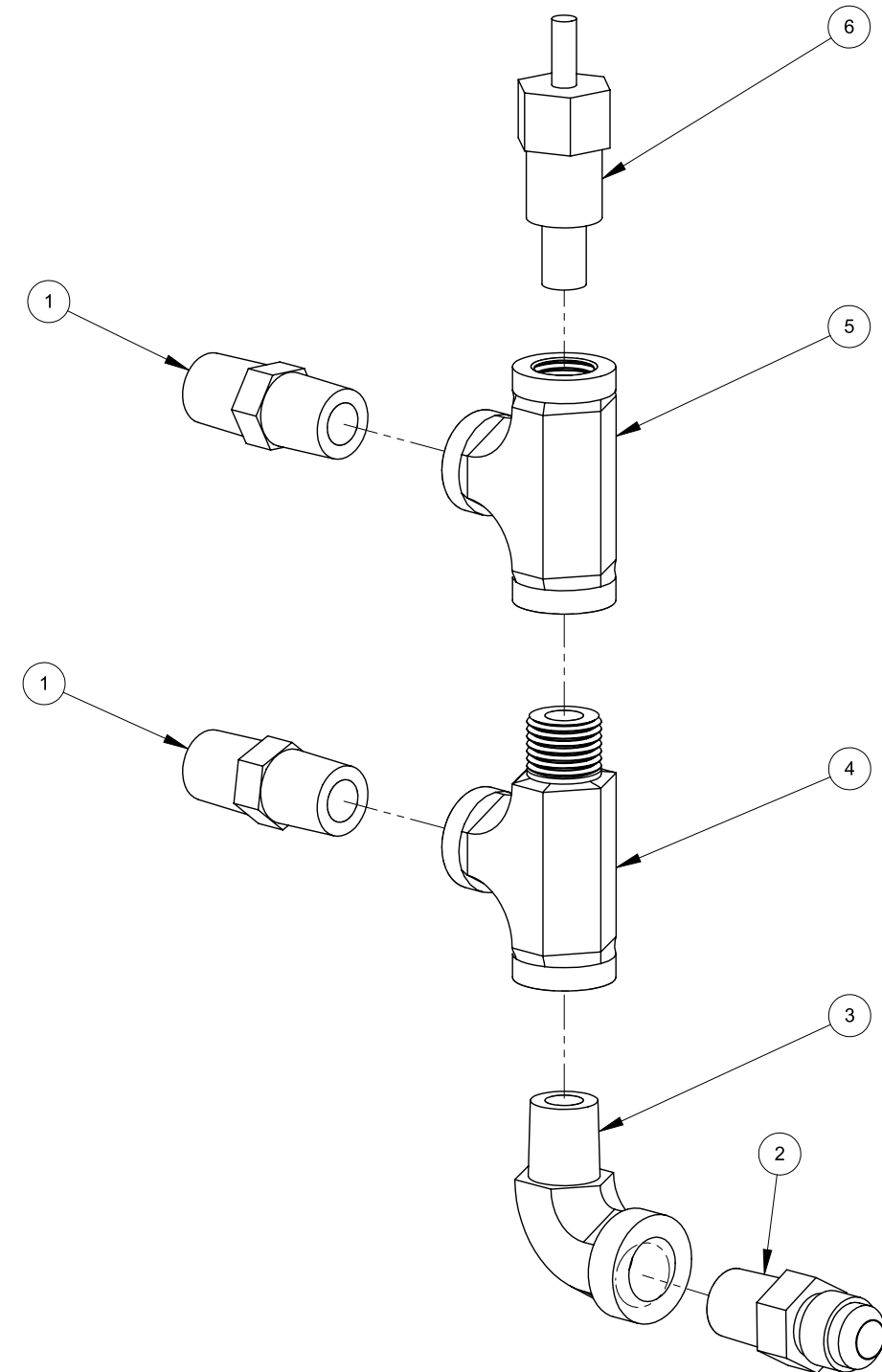
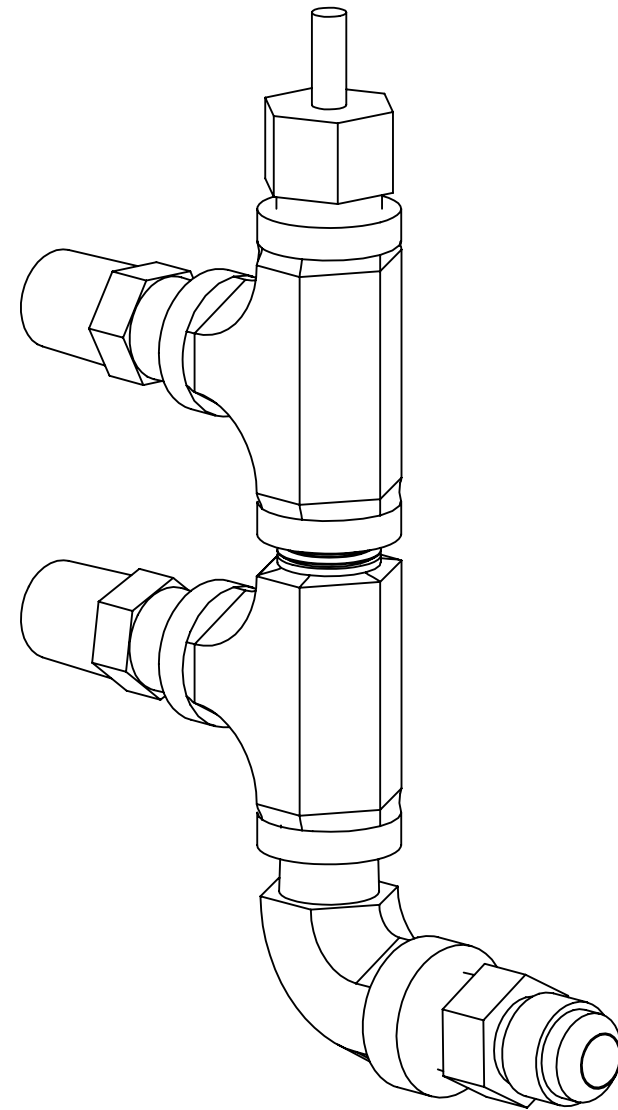
Figure 7-20. Instrument Panel Assembly
601-019-741 Rev. C



Instrument Panel Assembly Parts List

Item	Part Number	Description	Qty	Item	Part Number	Description	Qty
1	601-009-741	Assembly, By-Pass Valve	1	21	000-100-168	Panel, Instrument - Coated	1
2	601-008-741	Assembly, Hi PSI	1	22	000-105-012	Plate, Machine Serial I.D.	1
3	000-027-014	Cap, Garden Hose	1	23	000-106-024	Plug, 5/8" Black Dome	2
4	000-033-023	Clamp, 3/4" Nylon Hose	3	24	000-052-690	Quick Connect, Female S/S	2
5	000-052-610	Coupler, 1/4 FPT S/S	1	25	000-135-053	Regulator, Hi PSI Snubber	1
6	000-052-272	Cup, Gravity Feed Oil Blower Lube Port	1	26	000-140-015	Rivet, 1/8" X 1/4" Lg. Pop	2
7	000-052-384	Elbow, 3/4" NPT X 45 Degree	1	27	000-143-126	Screw, #10-24UNC X 0.50" Lg. Hex Head	2
8	000-057-055	Gasket, Garden Hose	1	28	000-143-166	Screw, #10-24UNC X 3/8" Lg. Hex Head	2
9	000-074-155	Gauge, Pressure 0 -1,500 psi	1	29	000-143-134	Screw, 10-24 X 1" HHCS S/S	4
10	000-060-015	Grommet, 2.5" - Modified	1	30	000-131-027	Trimlok, 1/8" X 3/16" Lg.	1 ft
12	000-052-338	Insert, #1212 (3/4" NPT X 3/4" Barb)	1	31	000-169-009	Valve, 3/4" FPT Swing Check	1
13	000-052-096	Insert, #F23 (1/8" FPT X 3/16" Barb)	1	32	000-169-201	Valve, 3/4" Heater Panel Mount	1
14	000-052-756	Insert, 3/4" NPT X 3/4" Elbow	2	33	000-174-001	Washer, #10 Flat	8
15	000-081-328	Label, ANSI Warning - Large	1	34	000-174-014	Washer, #10 Lock	2
16	000-081-376	Label, Lower Instrument Panel	1	35	000-174-015	Washer, #10 Outside Star	3
17	000-081-375	Label, Upper Instrument Panel	1	36	000-174-050	Washer, 1" Flat	1
18	000-052-506	Nipple, 1/4" MPT X 9/16"	1	37	000-174-063	Washer, 1.5" O.D. X 1.073" I.D. X 0.075" Thk.	1
19	000-052-281	Nipple, 3/4" NPT X 3/4" Male Garden Hose	1	38	000-174-012	Washer, 1/2 SAE H/D	4
20	000-094-004	Nut, #10-24UNC Hex	3	39	000-174-005	Washer, 3/8" Flat	1

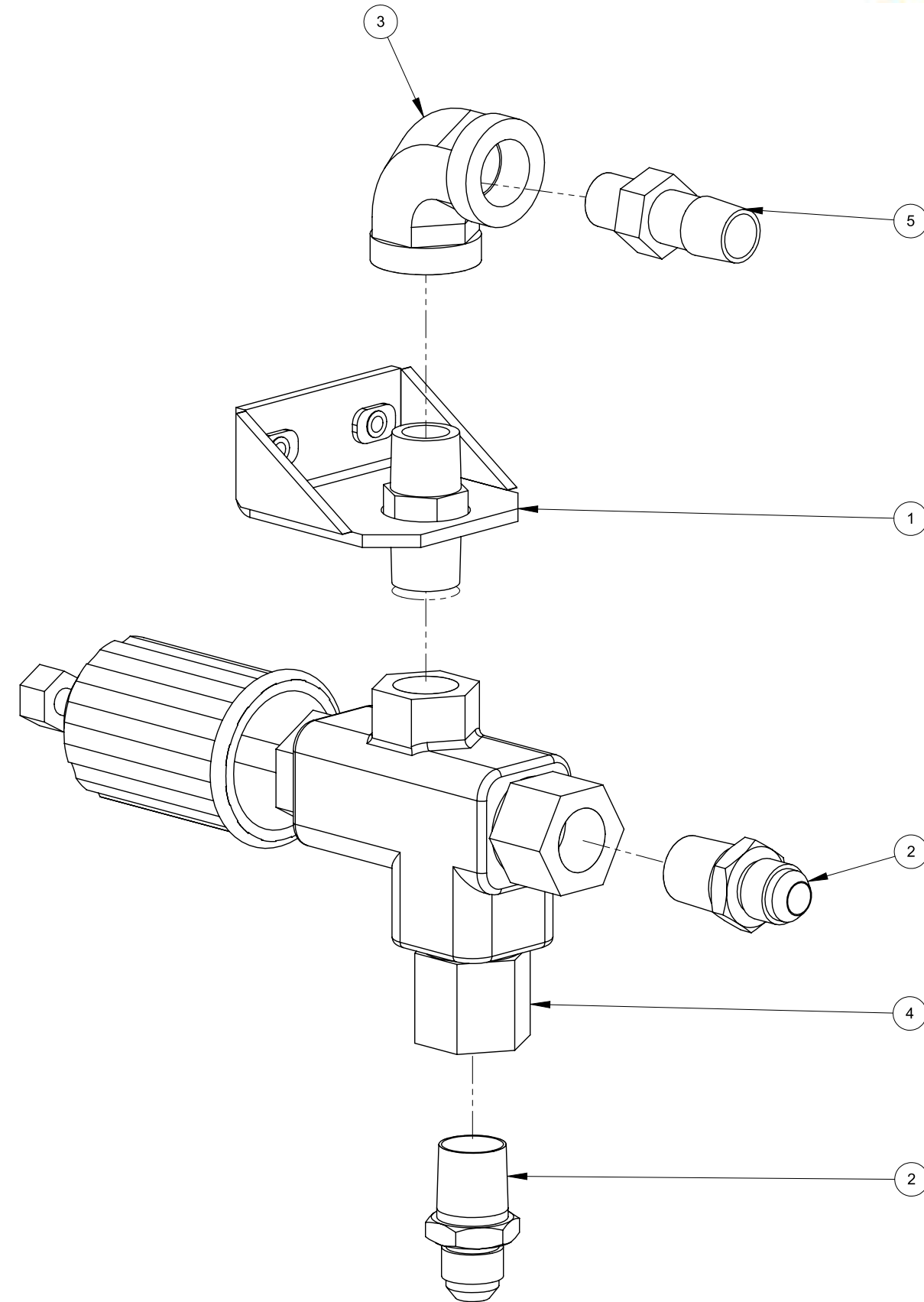
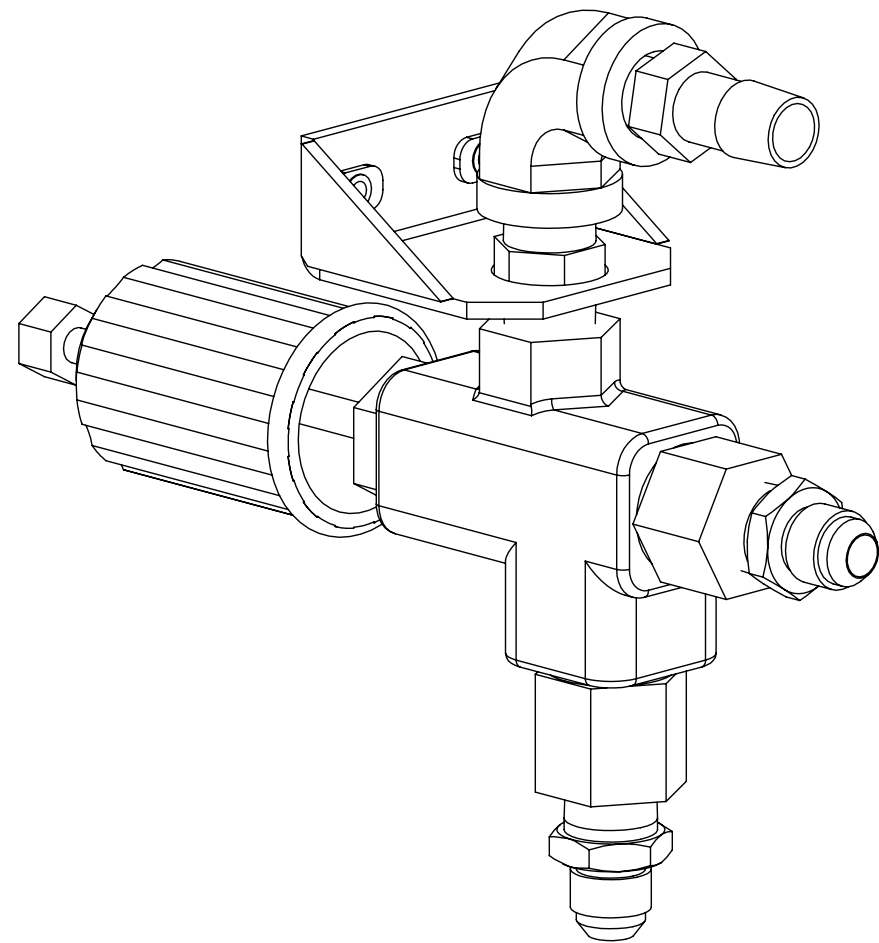
Figure 7-21. Hi PSI Assembly
601-008-741 Rev. C



Hi PSI Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-095	Nipple, 1/4" S/S Hex	2
2	000-052-506	Nipple, 1/4" MPT X 9/16"	1
3	000-052-691	Elbow, 1/4" Street S/S	1
4	000-052-190	Tee, 1/4" Branch S/S	1
5	000-052-189	Tee, 1/4" Female S/S	1
6	000-149-035	Sender, Temperature - Coated	1

Figure 7-22. By-Pass Valve Assembly
601-009-741 Rev. D



By-Pass Valve Assembly Parts List

Item	Part Number	Description	Qty
1	000-015-515	Bracket, By-Pass Valve Mount - Weldment	1
2	000-052-507	Nipple, 3/8" NPT X 9/16"-18 37 Degree JIC S/S	2
3	000-052-188	Elbow, 3/8" S/S Female	1
4	000-169-178	Valve, S/S Press Reg	1
5	000-052-056	Insert, #68 GFBN	1

Figure 7-23. Front End Kit Assembly
601-021-132 Rev. C

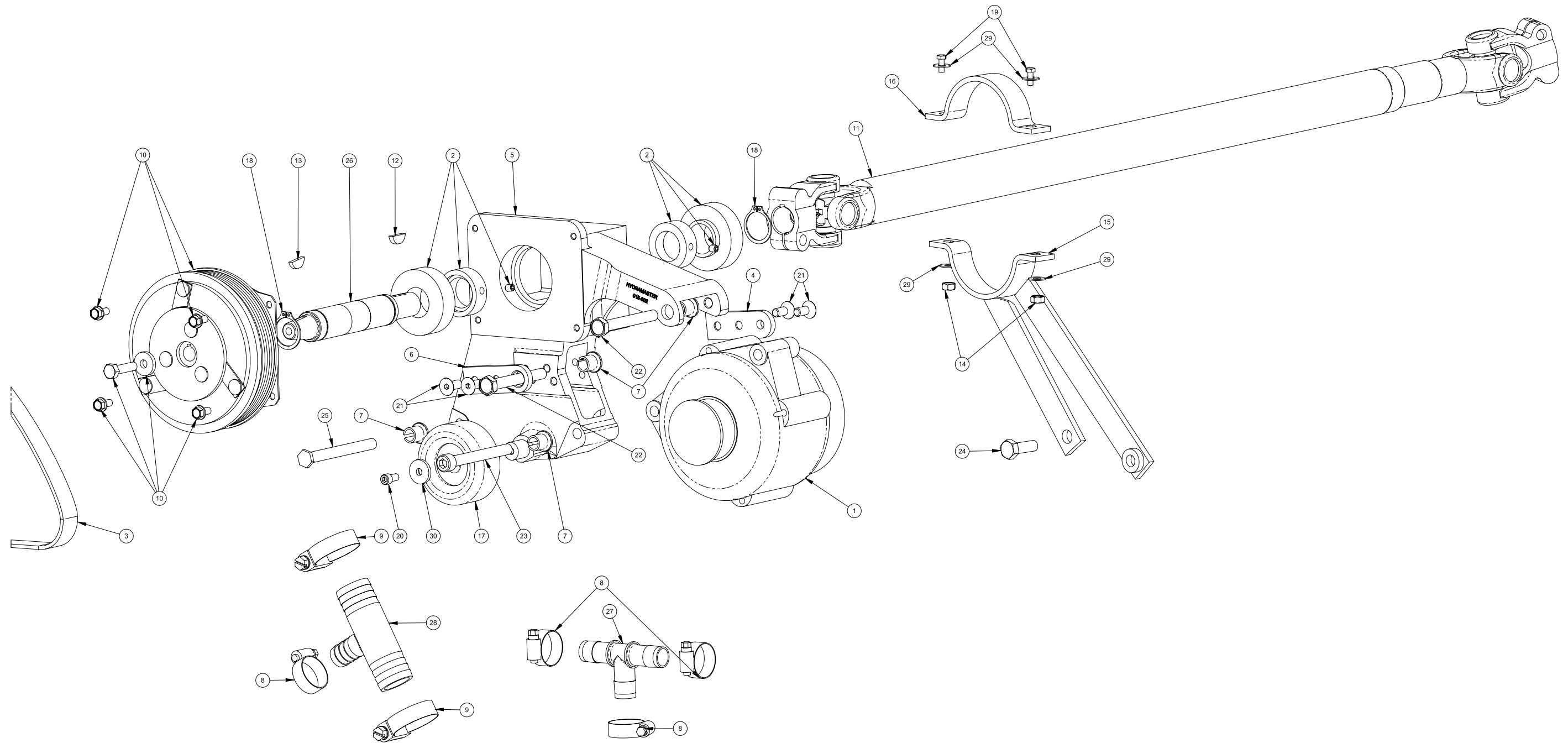
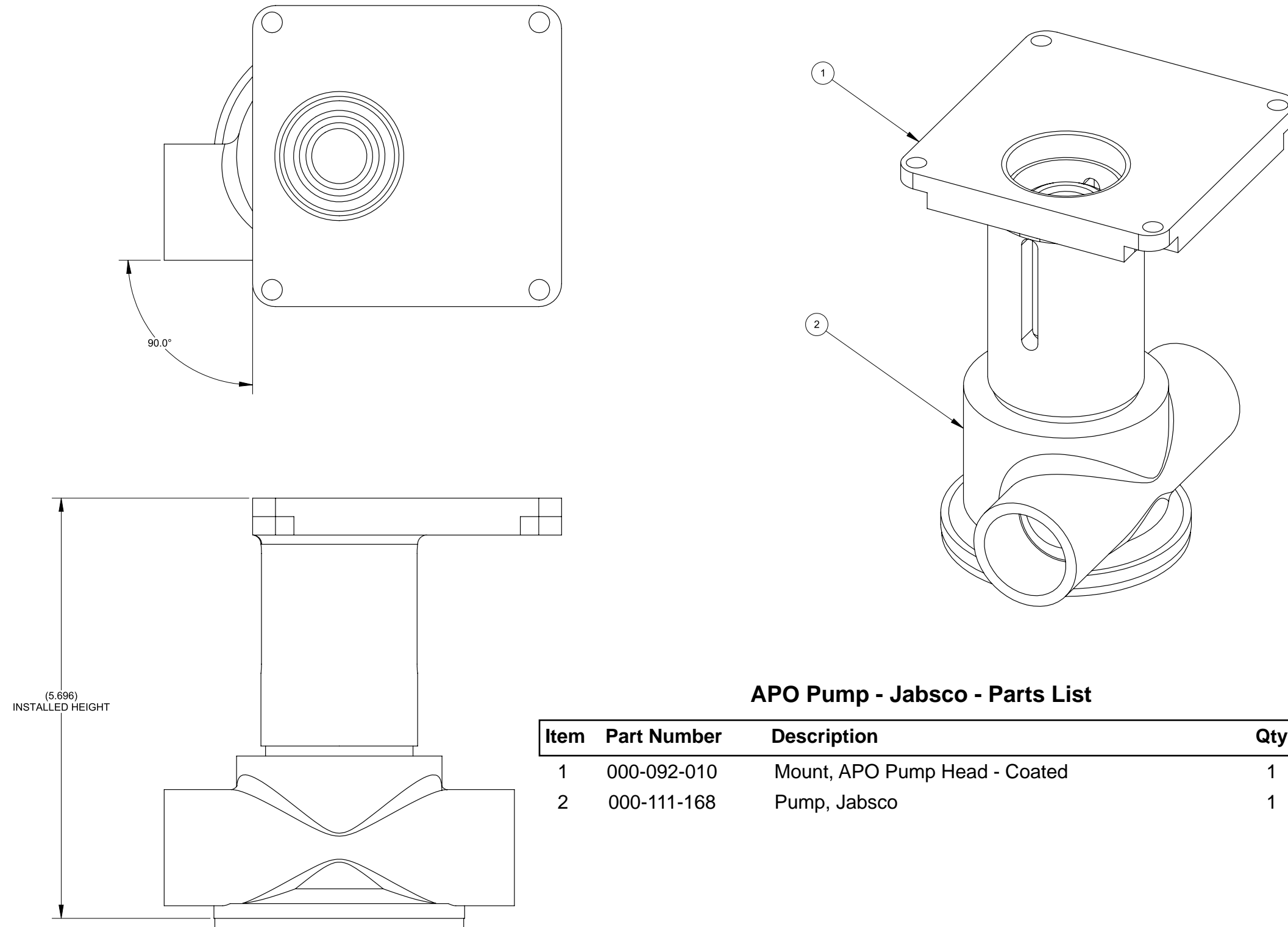


Figure 7-24. APO Pump - Jabsco - Assembly
000-111-169 Rev. B



Front End Kit Assembly Parts List

Item	Part Number	Description	Qty
1	- - -	Alternator (Part of Van)	1
2	000-008-011	Bearing, CDS Clutch	2
3	000-010-118	Belt, Poly	1
4	000-015-880	Bracket, Chevy Idler Casting - Rear	1
5	000-015-002	Bracket, CDS Front End Idler Casting	1
6	000-015-879	Bracket, Idler Casting - Front	1
7	000-054-141	Bushing, CDS Idler Casting - Alternator Motor	4
8	000-033-029	Clamp, Size #12 Hose	8
9	000-033-008	Clamp, Size #20 Hose	2
10	000-036-003	Clutch Assembly, 6" CDS Poly Groove	1
11	000-150-173	Drive Line Axle	1
12	000-077-009	Key, 3/16" X 3/4" Woodruff	1
13	000-077-008	Key, 5/32 X 3/4" Woodruff	1
14	000-094-010	Nut, 1/4"-20UNC Hex	2
15	000-108-127	Protector, Fly Strap - Coated	1

Item	Part Number	Description	Qty
16	000-108-009	Protector, Fly Strap - Top Clamp - Coated	1
17	000-109-095	Pulley, 76mm CDS Idler - Gates w/ Double Ro	1
18	000-139-005	Ring, CDS Clutch Shaft	2
19	000-143-126	Screw, #10-24UNC X 0.50" Lg. Hex Head	2
20	000-143-079	Screw, 1/4"-20UNC X 0.5" Lg. Socket Head	1
21	000-143-562	Screw, 5/16-18UNC X 0.75" Lg. Flat Head Allen	4
22	000-143-564	Screw, M10 X 1.5 X 80mm Lg. Hex Head	2
23	000-143-563	Screw, M10 X 1.5 X 90mm Lg. Socket Hd	1
24	000-143-078	Screw, M10 X 30mm Lg.	1
25	000-143-558	Screw, M10x1.5 X 90mm Lg. Mod. Thin Head	1
26	000-150-009	Shaft, Electric Clutch	1
27	000-052-717	Tee, 3/4" Barb X 3/4" Barb	1
28	000-052-716	Tee, Upper Coolant	1
29	000-174-003	Washer, 1/4" Flat	4
30	000-174-104	Washer, Chevy CDS Idler Casting	1

Figure 7-25. Dura-Flow Automatic Pump Out (APO) Assembly
000-079-001 Rev. D

Dura-Flow Automatic Pump Out (APO) Assembly Parts List

Item	Part Number	Description	Qty
1	000-111-169	Assembly, APO Pump - Jabsco	1
2	000-015-908	Bracket, Dura-Flow Support - Fabricated	1
3	000-033-029	Clamp, Size #12 Hose	2
4	000-033-020	Clamp, Size #16 Hose	2
5	000-052-131	Elbow, 1" NPT X 1" Barb (Glass Filled Black Nylon)	1
6	000-068-528	Hose, 1" I.D. Red 200 psi	1
7	000-068-069	Hose, 3/4" I.D. X 1.109" O.D.	1
8	000-073-011	Impeller, Replacement for Posi-Flow and Dura-Flow	1
9	000-052-757	Insert, 1" NPT X 3/4" Elbow	1
10	000-078-517	Kit, Jabsco Seal (Replacement)	1
11	000-091-042	Motor, Leeson	1
12	000-143-074	Screw, 1/4"-20UNC X 0.50" Lg. Hex Head Self-Tapping	4
13	000-143-001	Screw, 1/4"-20UNC X 3/4" Lg. Hex Head	2
14	000-143-566	Screw, 1/4"-28UNF X 0.75" Lg. Socket Head	4
15	000-174-002	Washer, 1/4" Flat	6

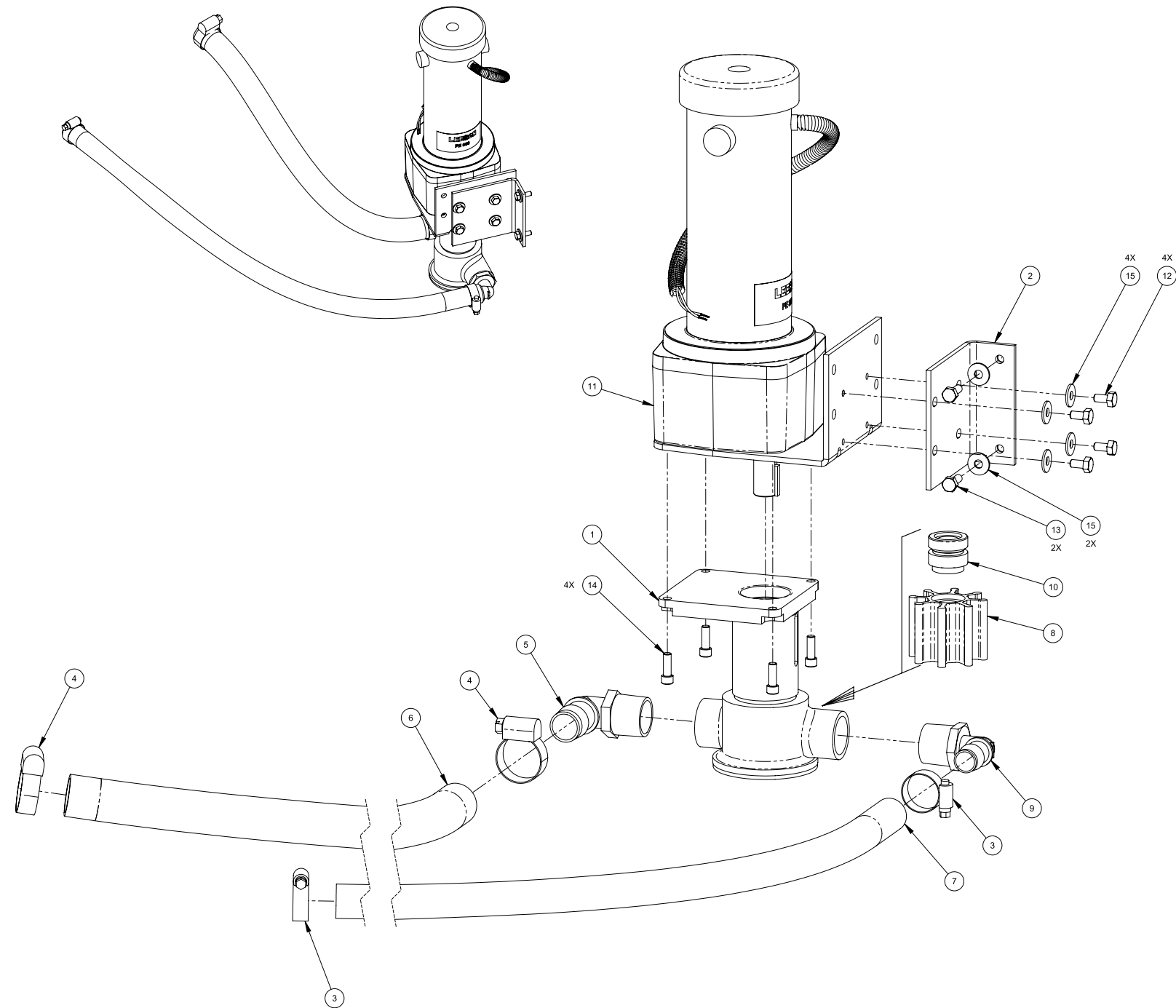
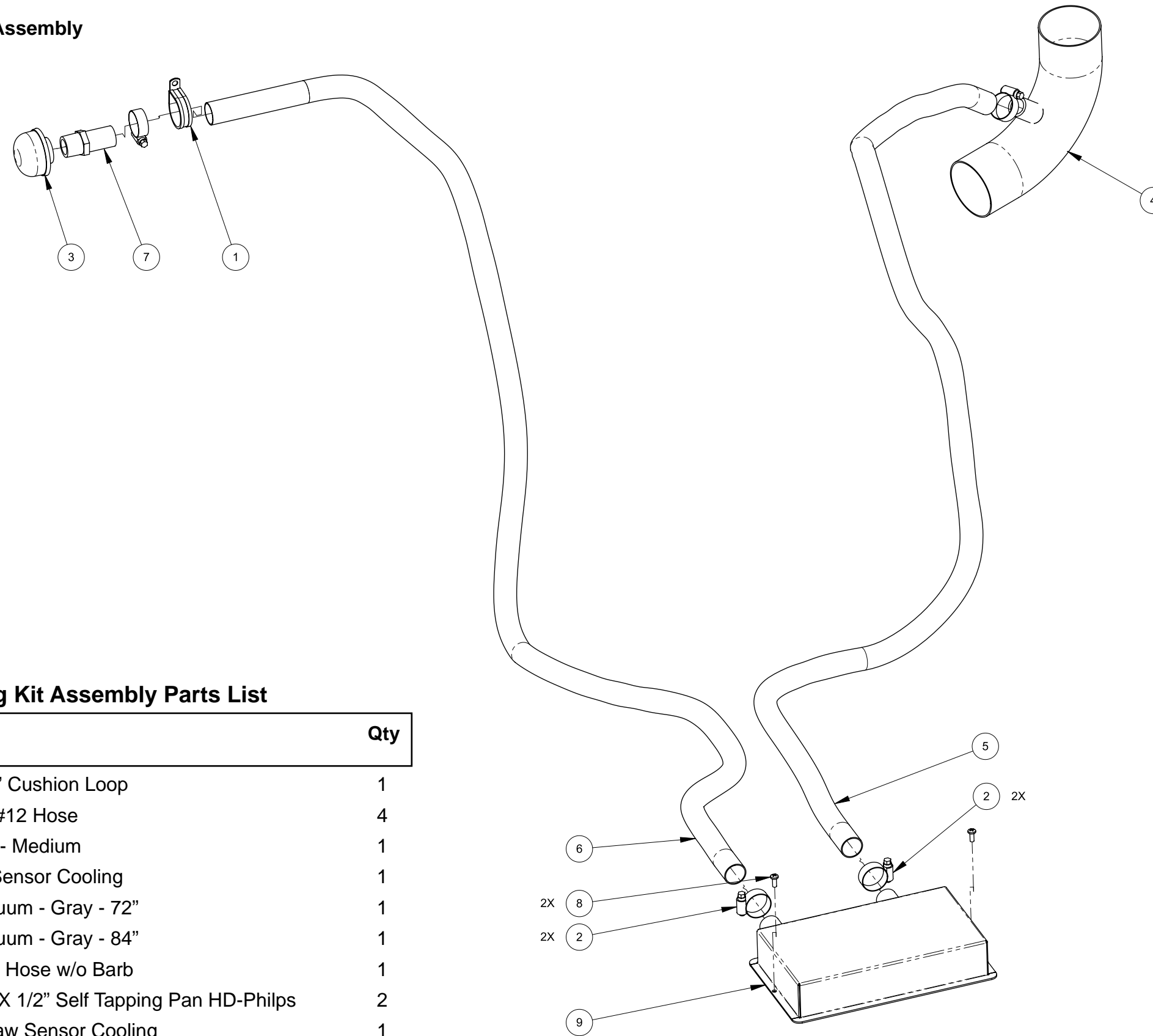


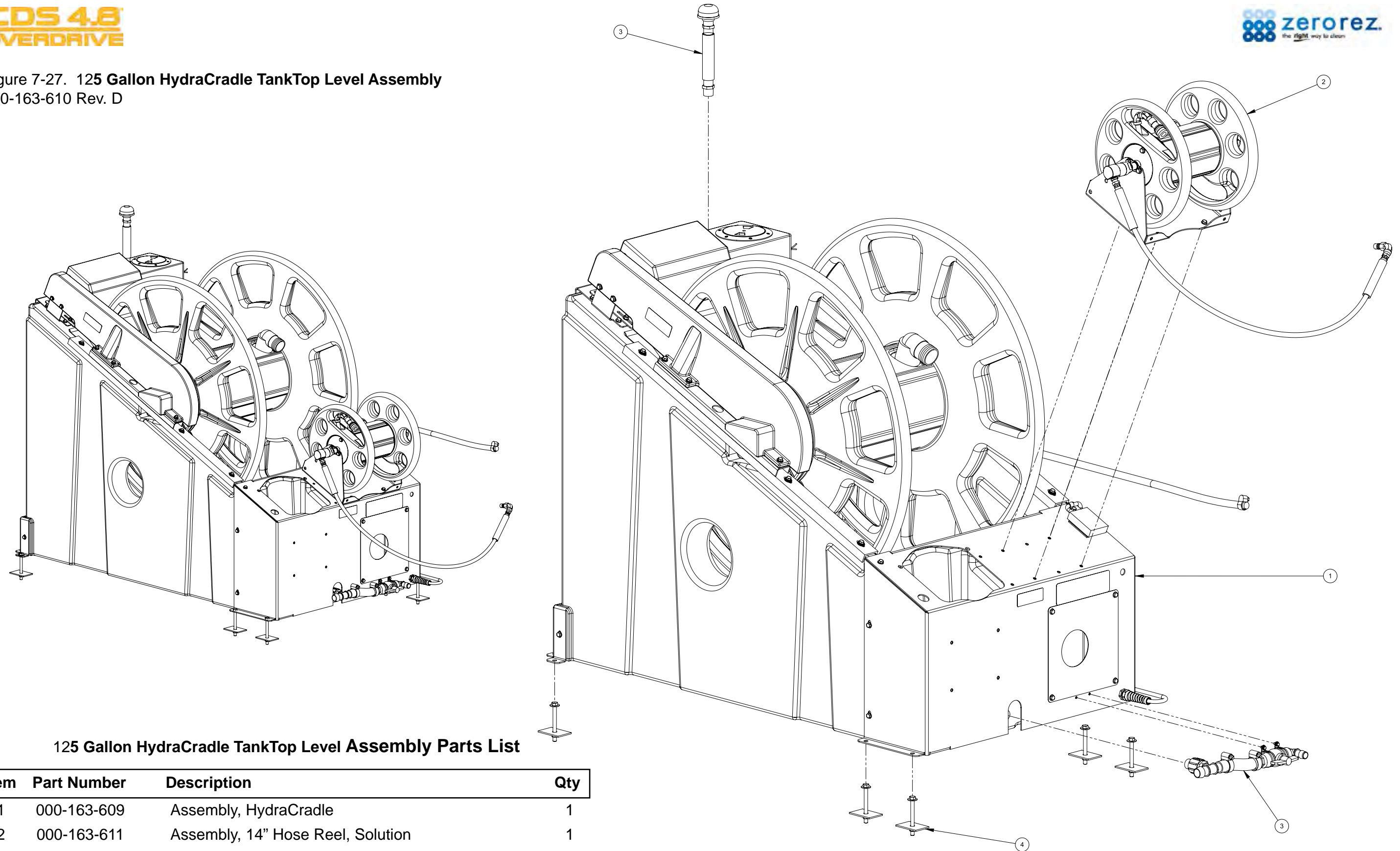
Figure 7-26. Yaw Sensor Cooling Kit Assembly
000-079-130



Yaw Sensor Cooling Kit Assembly Parts List

Item	Part Number	Description	Qty
1	000-033-053	Clamp, 1-1/2" Cushion Loop	1
2	000-033-029	Clamp, Size #12 Hose	4
3	000-049-020	Filter Screen - Medium	1
4	000-052-034	Fitting, Yaw Sensor Cooling	1
5	000-068-829	Hose, 1" Vacuum - Gray - 72"	1
6	000-068-828	Hose, 1" Vacuum - Gray - 84"	1
7	000-052-908	Insert 3/4 X 1 Hose w/o Barb	1
8	000-143-112	Screw, 10-24 X 1/2" Self Tapping Pan HD-Philps	2
9	000-041-312	Weldment, Yaw Sensor Cooling	1

Figure 7-27. 125 Gallon HydraCradle TankTop Level Assembly
000-163-610 Rev. D



125 Gallon HydraCradle TankTop Level Assembly Parts List

Item	Part Number	Description	Qty
1	000-163-609	Assembly, HydraCradle	1
2	000-163-611	Assembly, 14" Hose Reel, Solution	1
3	000-078-202	Kit, HydraCradle Hose and Fittings	1
4	000-078-200	Kit, Tie Down HydraCradle	1

Figure 7-28. 125 Gallon HydraCradle Subassembly Level - View 1 of 4
000-163-609 Rev. C

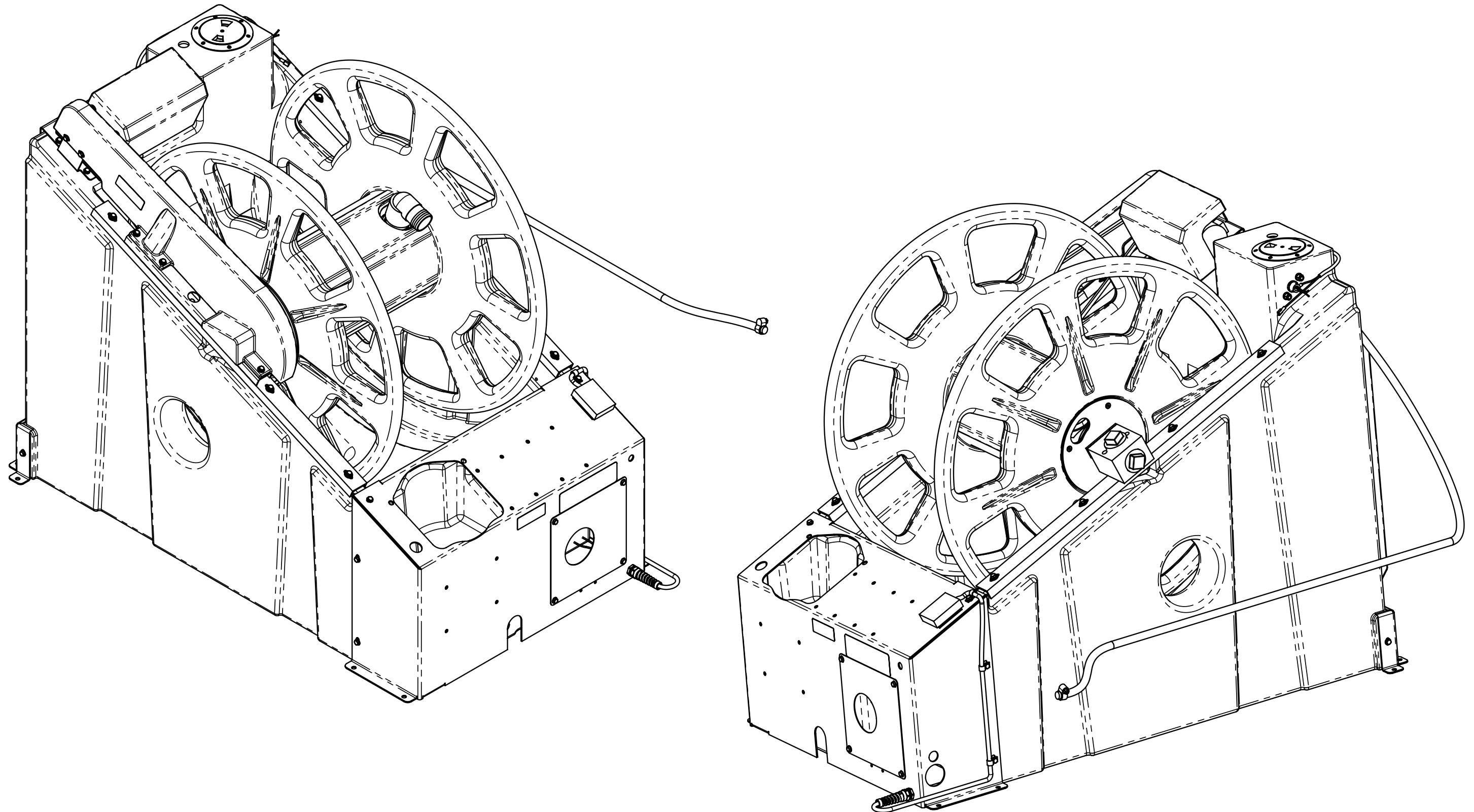


Figure 7-29. 125 Gallon HydraCradle Subassembly Level - View 2 of 4
000-163-609 Rev. C

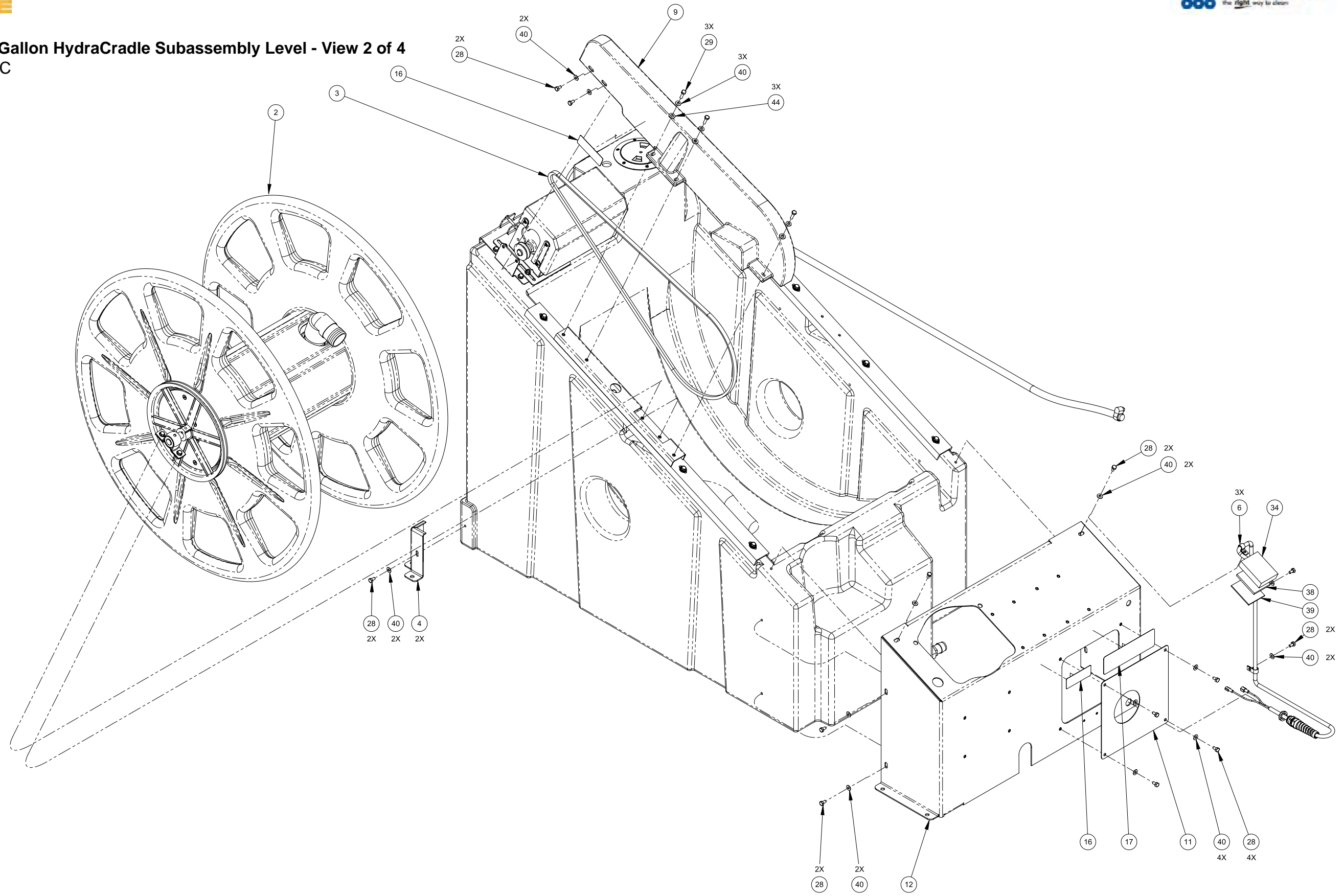


Figure 7-30. 125 Gallon HydraCradle Subassembly Level - View 3 of 4
000-163-609 Rev. C

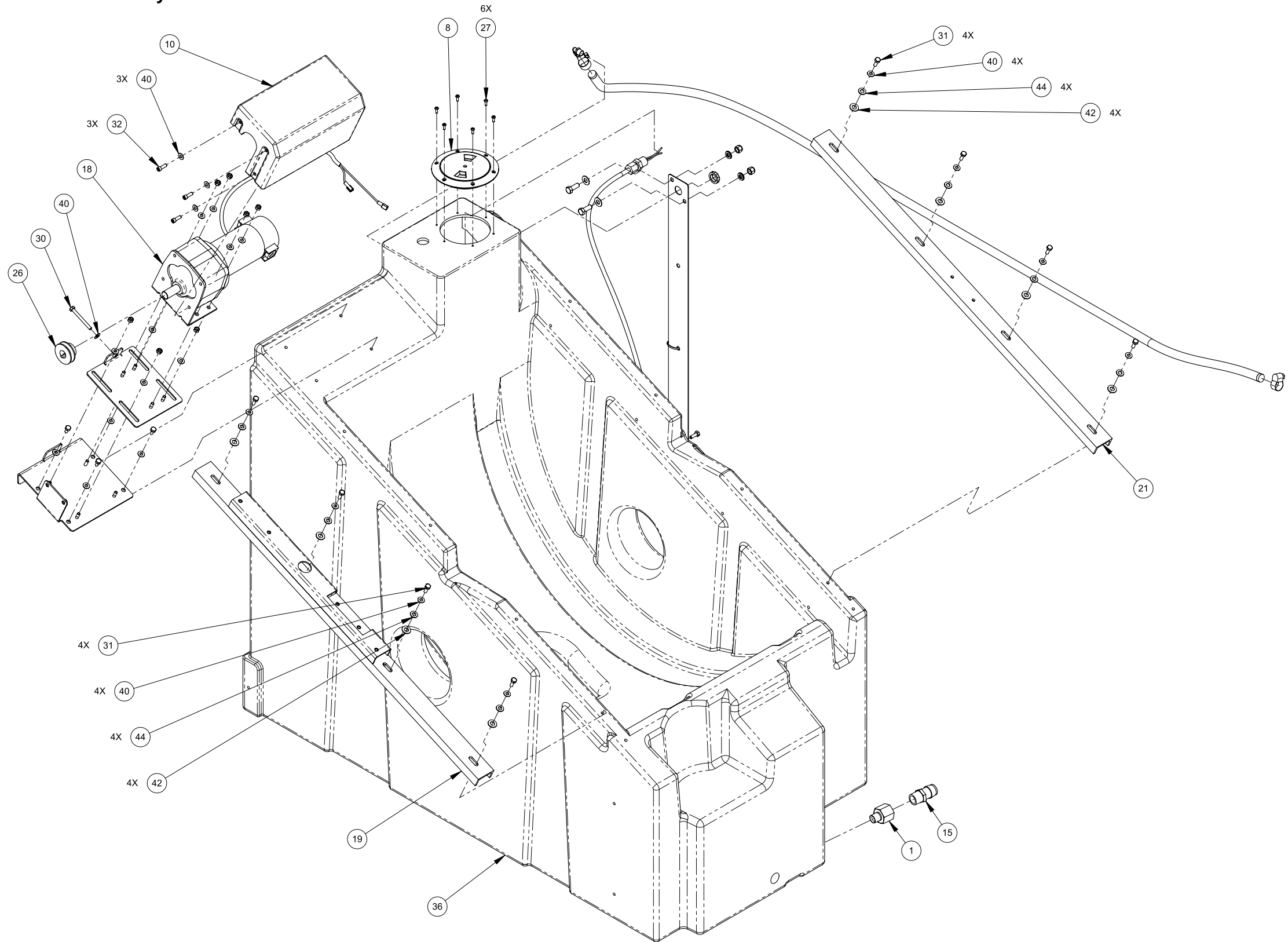
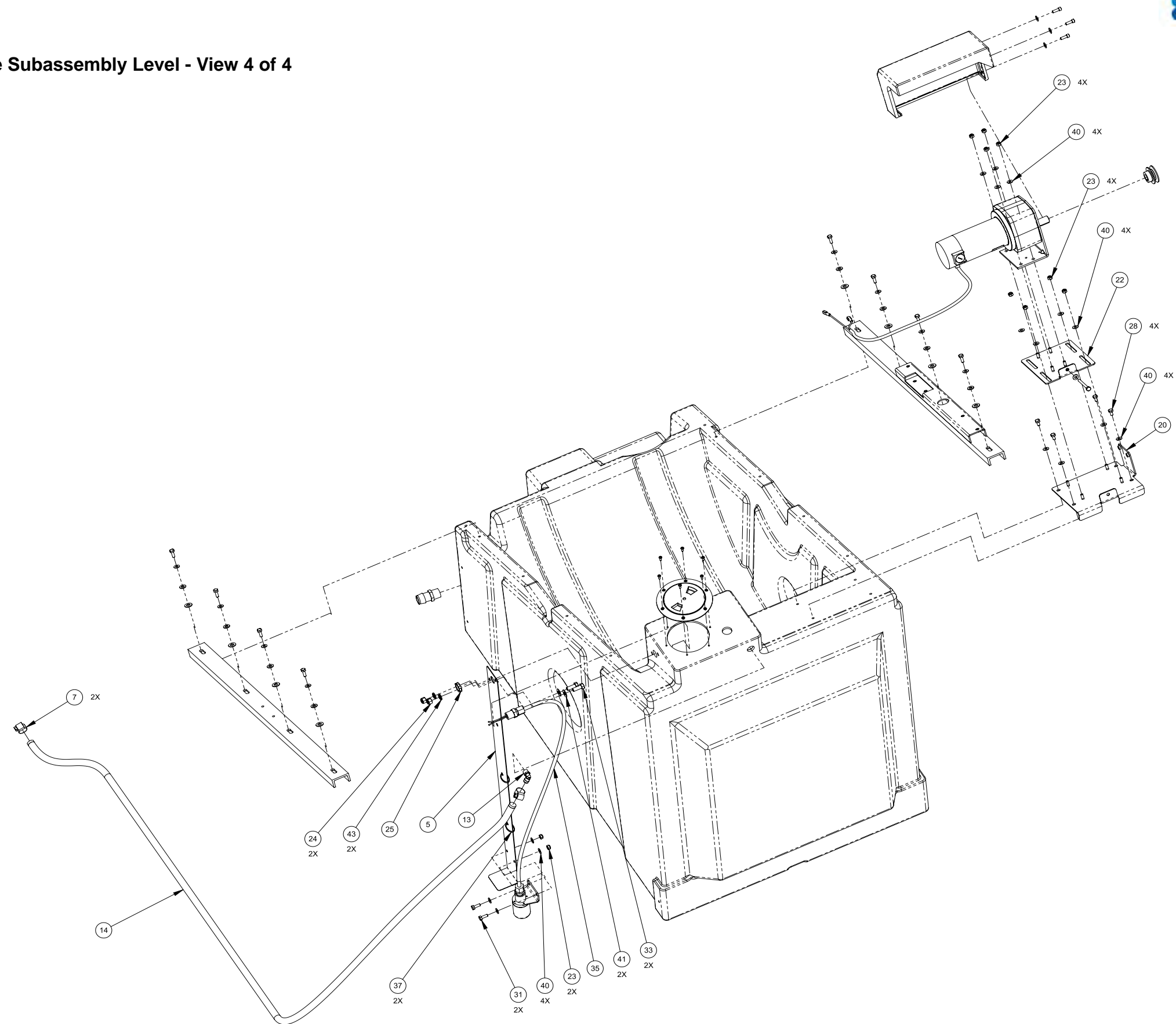


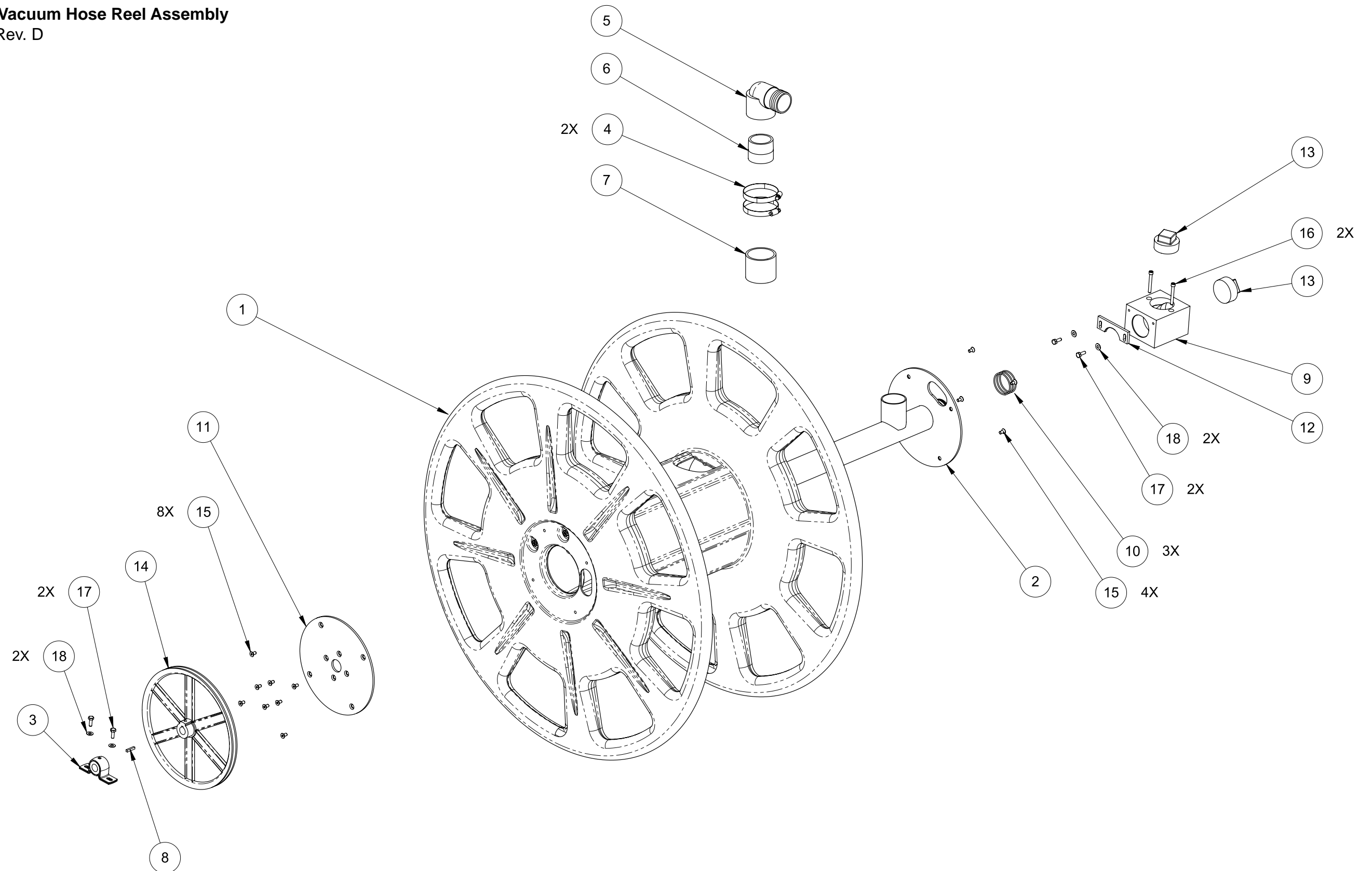
Figure 7-31. 125 Gallon HydraCradle Subassembly Level - View 4 of 4
000-163-609 Rev. C



125 Gallon HydraCradle Tank Subassembly Level Parts List

Item	Part Number	Description	Qty	Item	Part Number	Description	Qty
1	000-001-109	Adapter, 1/2 X 3/4 NPT S/S	1	23	000-094-009	Nut, 1/4"-20UNC Nylock	10
2	000-163-612	Assembly, Vacuum Hose Reel	1	24	000-094-100	Nut, 3/8-16, Nylock	2
3	000-010-030	Belt, 4L, 73" Long	1	25	000-094-036	Nut, 1/2" NPT Pipe Plastic	1
4	000-015-977	Bracket, Rear Base - Coated	2	26	000-109-122	Pulley, 2" O.D. X 3/4 Bore	1
5	000-015-012	Bracket, Submersible Float Switch - Fabricated	1	27	000-143-314	Screw, #8 X 1/2" Lg. Pan Head	6
6	000-033-046	Clamp, 1/2" Wide X 1/2" Tube	3	28	000-143-333	Screw, 1/4"-20UNC X 0.50" Lg. Hex Head	18
7	000-033-006	Clamp, Size #8	2	29	000-143-002	Screw, 1/4"-20UNC X 1.00" Lg. Hex Head	3
8	000-041-365	Cover, 4" Round	1	30	000-143-594	Screw, 1/4"-20UNC X 2 1/2" Lg. HHCS, Full Threads	1
9	000-041-475	Cover, Belt	1	31	000-143-001	Screw, 1/4"-20UNC X 3/4" Lg. Hex Head	10
10	000-041-474	Cover, Motor	1	32	000-143-566	Screw, 1/4"-28UNFX 0.75" Lg. Socket Head	3
11	000-041-477	Cover, Pump Access - Coated	1	33	000-143-096	Screw, 3/8"-16UNC X 1.00" Lg. Hex Head	2
12	000-041-476	Cover, Tank Front - Coated	1	34	000-157-156	Switch, Foot - Modified	1
13	000-052-484	Elbow, 1/2" NPT X 1/2 Hose	1	35	000-157-039	Switch, Modified Liquid Level	1
14	000-068-878	Hose, 1/2" Rubber - 8 ft Long	1	36	000-159-134	Tank, 125 Gallon, HydraCradle	1
15	000-052-125	Insert, 3/4" X 1" Hose Barb	1	37	000-162-002	Tie Wrap, 6" Nylon	2
16	000-081-327	Label, ANSI Warning	2	38	000-131-132	Velcro, Hook 2" Wide (3" Long)	1
17	000-081-335	Label, Large 8" X 2.375"	1	39	000-131-133	Velcro, Latch 2" Wide (3" Long)	1
18	000-091-046	Motor Assembly, 1/6HP, 12V DC, Modification	1	40	000-174-003	Washer, 1/4" Flat	45
19	000-092-033	Mount, Bearing - Coated	1	41	000-174-032	Washer, 3/8" Flat	2
20	000-092-027	Mount, Drive Motor - Coated	1	42	000-174-005	Washer, 3/8" Flat	8
21	000-092-034	Mount, Live Center - Coated	1	43	000-174-029	Washer, 3/8" Rubber Backed	2
22	000-092-026	Mount, Motor Adjustment - Coated	1	44	000-174-049	Washer, 5/16" Flat	11

Figure 7-32. Vacuum Hose Reel Assembly
000-163-612 Rev. D

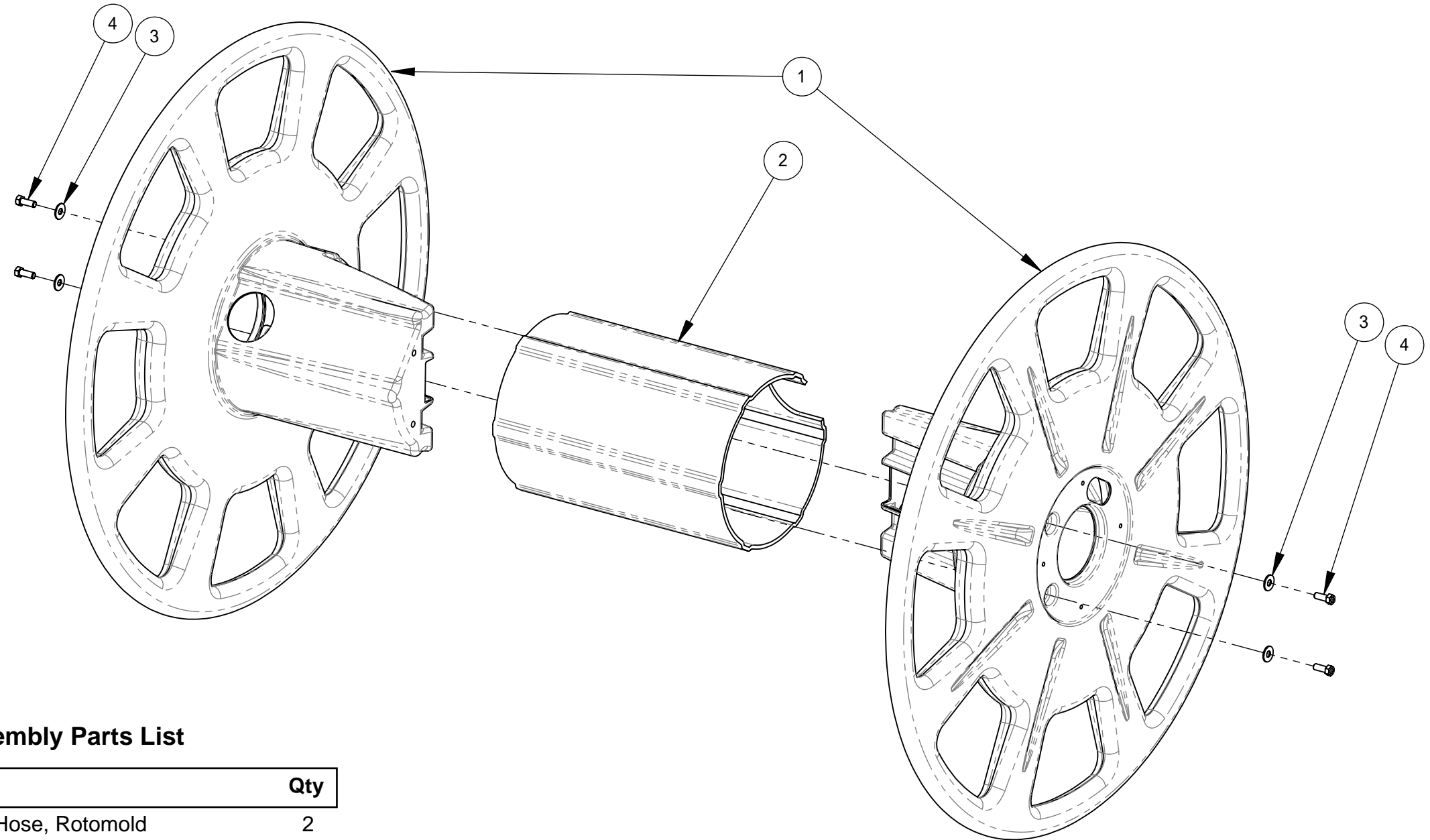


Vacuum Hose Reel Assembly Parts List

Item	Part Number	Description	Qty
1	000-163-597	Assembly, Hub - Vacuum Hose Reel	1
2	000-141-044	Axle, Main Shaft, Welded	1
3	000-008-053	Bearing, Pillow Block, 3/4	1
4	000-033-012	Clamp, Size #44 Hose	2
5	000-052-222	Elbow, 2" Barb X 2" FPT	1
6	000-052-820	Half Nipple, 2" NPT X 2" Lg	1
7	000-068-887	Hose, 2-1/2" Red Stripe X 2-3/8" Lg.	1
8	000-077-016	Key, 3/16 X 3/16 X 1.0" Lg	1
9	000-092-025	Mount, Live Center	1
10	000-097-071	O-Ring, AS568A-136	3

Item	Part Number	Description	Qty
11	000-105-661	Plate Reel Mtg Brg Side Coated	1
12	000-105-560	Plate, Locking, Vac Hose Reel	1
13	000-106-018	Plug, 2" NPT, Square Head	2
14	000-109-128	Pulley, 12" O.D. X 3/4 Bore	1
15	000-143-596	Screw, 1/4"-20UNC X 0.50" Lg, Flat Head	12
16	000-143-606	Screw, 1/4"-20UNC X 2" Lg. Socket Head	2
17	000-143-001	Screw, 1/4"-20UNC X 3/4" Lg. Hex Head	4
18	000-174-003	Washer, 1/4" Flat	4

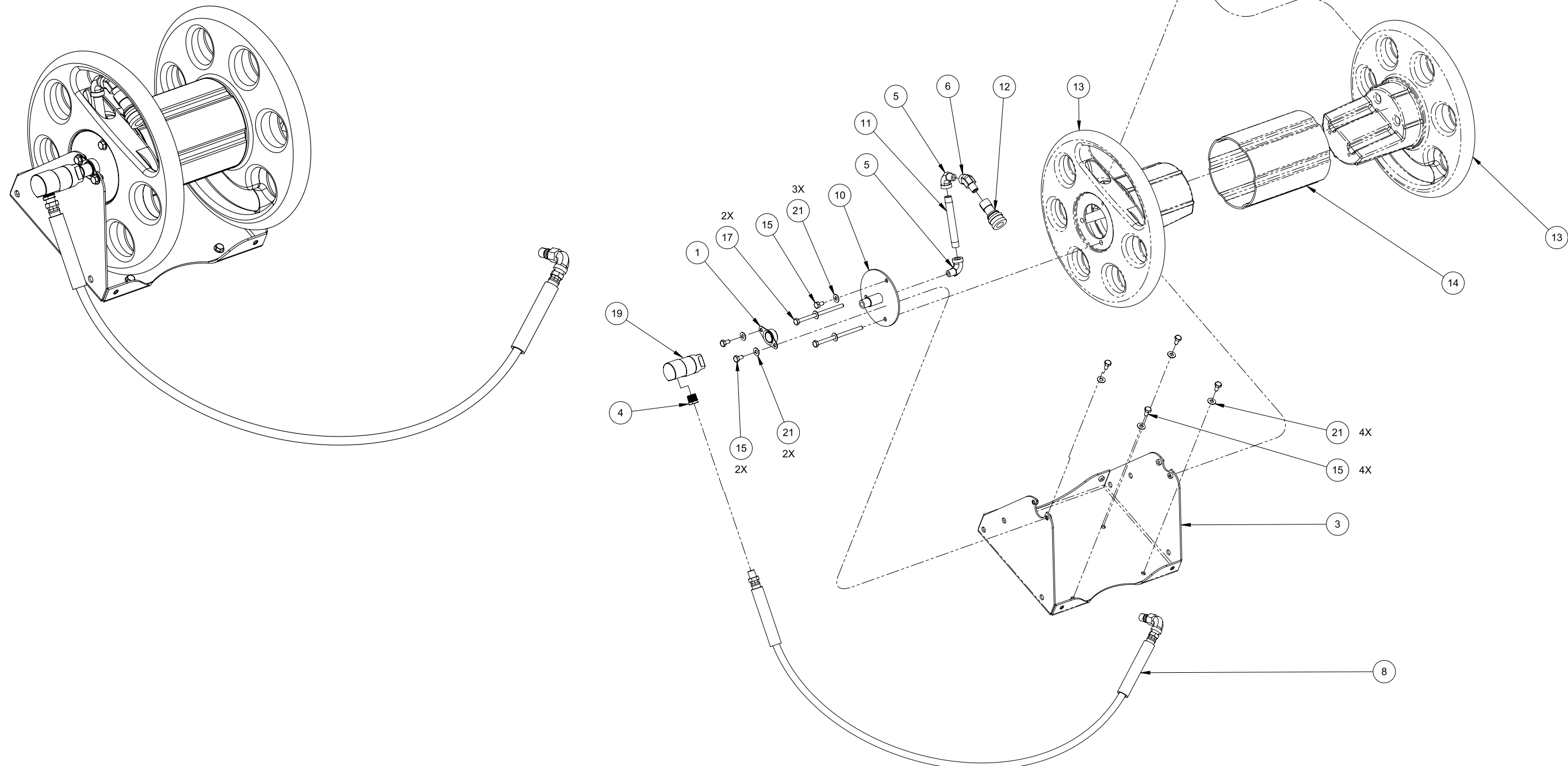
Figure 7-33. Vacuum Hose Reel Hub Assembly
000-163-597 Rev.A



Vacuum Hose Reel Hub Assembly Parts List

Item	Part Number	Description	Qty
1	000-163-595	Reel, 38" O.D., Vacuum Hose, Rotomold	2
2	000-163-596	Reel, Center Core, Vacuum Hose, Rotomold	1
3	000-174-005	Washer, 3/8" Flat	4
4	000-143-018	Screw, 3/8"-16UNC X 1" Lg. Hex Head - Grade 8	4

Figure 7-34. 14" Solution Hose Reel Assembly
000-163-611 Rev. D

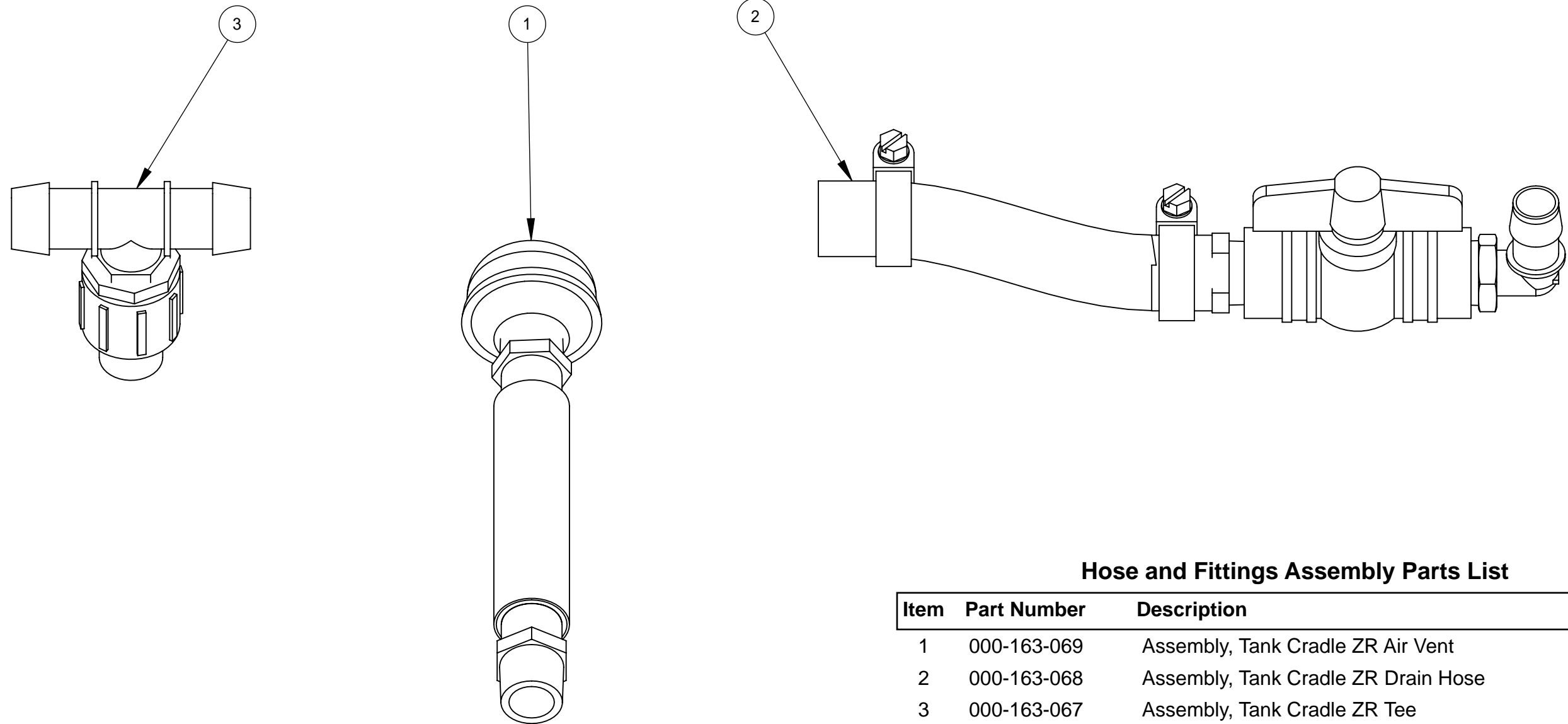


14" Solution Hose Reel Assembly Parts List

Item	Part Number	Description	Qty
1	000-008-054	Bearing, Face Flange	1
2	000-008-055	Bearing Tensioner	1
3	000-015-979	Bracket, Reel Mount - Coated	1
4	000-052-007	Bushing, 3/8" M X 1/4 F	1
5	000-052-691	Elbow, 1/4" Street S/S	2
6	000-052-745	Elbow, 1/4", 45 Degree Street S/S	1
7	000-061-152	Handle, Crank - Modified	1
8	000-068-251	Hose Assembly, 1/4" Solution X 96" Lg.	1
9	000-092-028	Mount, 14" Reel Crank - Coated	1
10	000-092-029	Mount, 14" Reel, Live Center - Coated	1
11	000-052-678	Nipple, 1/4 NPT X 4", Sch 80	1

Item	Part Number	Description	Qty
12	000-052-690	Quick Connect, Female S/S	1
13	000-163-598	Reel, 14" Rotomold	2
14	000-163-599	Reel; Center Core, Rotomold	1
15	000-143-333	Screw, 1/4"-20UNC X 0.50" Lg. Hex Head	8
16	000-143-599	Screw, 1/4"-20UNC X 3/4" Lg. Shcs, S/S	2
17	000-143-610	Screw, 1/4"-20UNC X 4.50" Lg. Hex Head	4
18	000-154-179	Spacer, 0.82" I.D. X 1.05" O.D. X 0.5" Lg	1
19	000-163-575	Swivel, 3/8 Live Solution, Stainless Steel w/ Viton Seals	1
20	000-143-589	Thumb Screw, 1/4-20 X 1-1/2 Lg, w/ Rosette Hd	1
21	000-174-003	Washer, 1/4" Flat	13

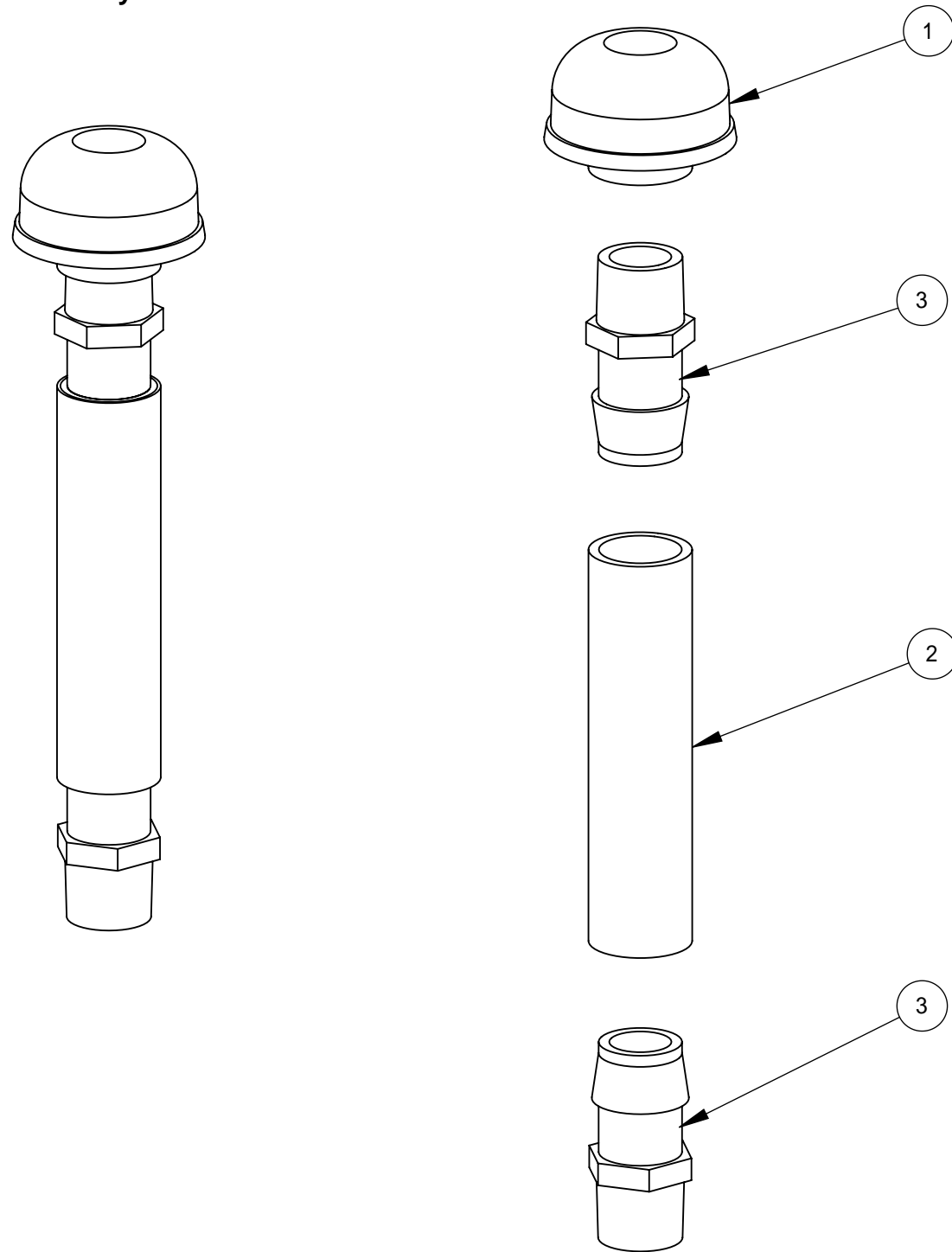
Figure 7-35. Hose and Fittings Assembly
000-078-202 Rev. A



Hose and Fittings Assembly Parts List

Item	Part Number	Description	Qty
1	000-163-069	Assembly, Tank Cradle ZR Air Vent	1
2	000-163-068	Assembly, Tank Cradle ZR Drain Hose	1
3	000-163-067	Assembly, Tank Cradle ZR Tee	1

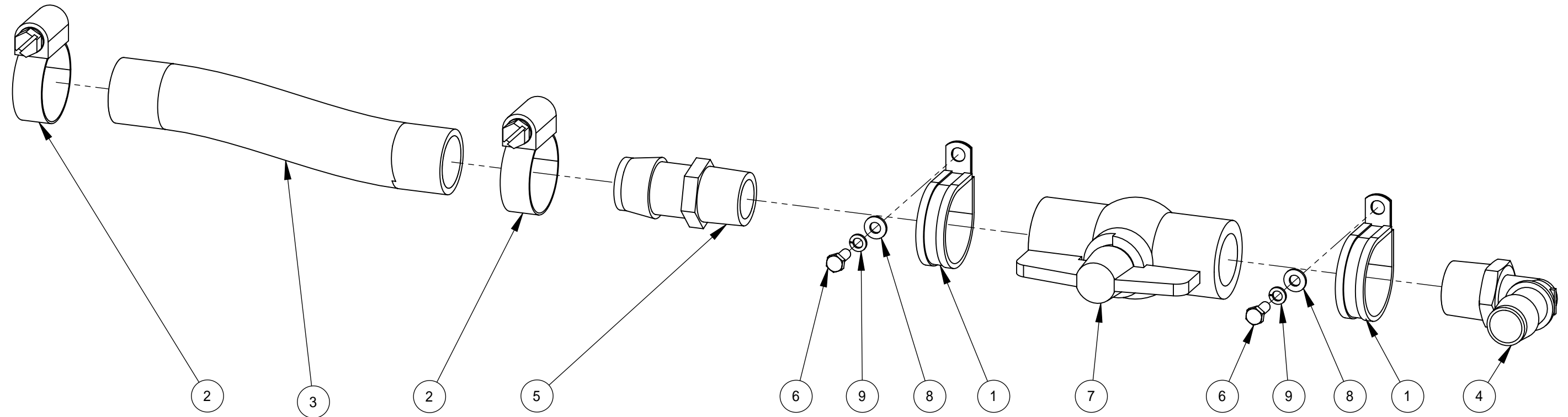
Figure 7-36. Air Vent Assembly
000-163-069 Rev. A



Air Vent Assembly Parts List

Item	Part Number	Description	Qty
1	000-049-020	Filter Screen - Medium	1
2	000-068-876	Hose, 1" I.D. Green Stripe X 5" Lg.	1
3	000-052-125	Insert, 3/4" X 1" Hose Barb	2

Figure 7-37. Drain Hose Assembly
000-163-068 Rev. A



Drain Hose Assembly Parts List

Item	Part Number	Description	Qty
1	000-033-053	Clamp, 1-1/2" Cushion Loop	2
2	000-033-020	Clamp, Size #16 Hose	2
3	000-068-877	Hose, 1" I.D. Green Stripe X 7" Lg.	1
4	000-052-756	Insert, 3/4" NPT X 3/4" Elbow	1
5	000-052-125	Insert, 3/4" X 1" Hose Barb	1
6	000-143-126	Screw, #10-24 UNC X 0.50" Lg. Hex Head	2
7	000-169-202	Valve, 3/4" FPT Ball Valve	1
8	000-174-001	Washer, #10 Flat	2
9	000-174-014	Washer, #10 Lock	2

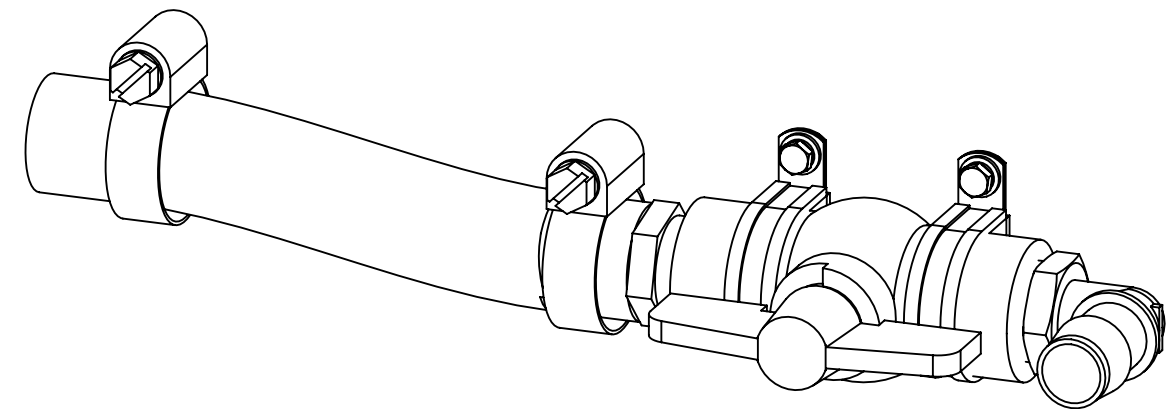
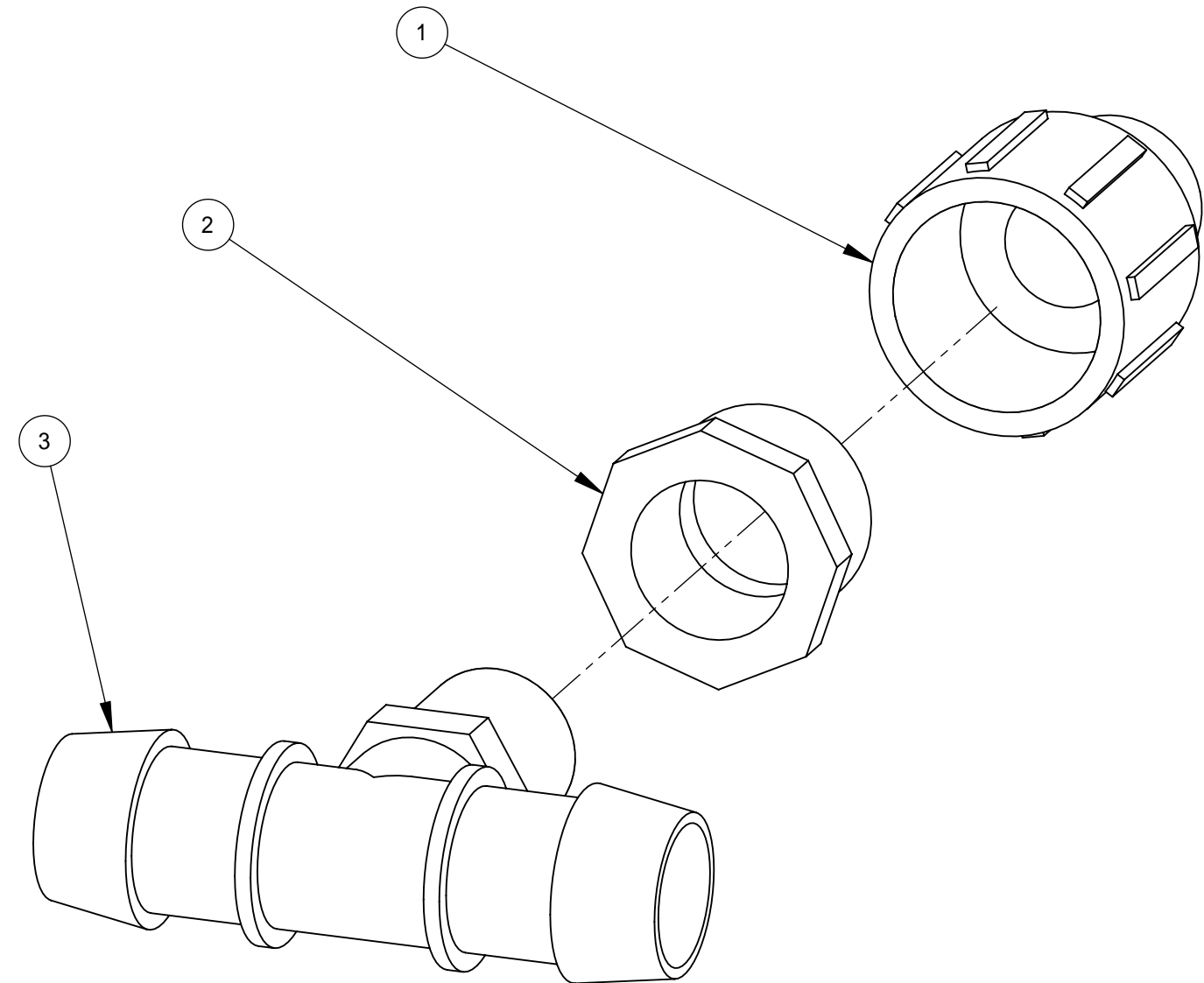
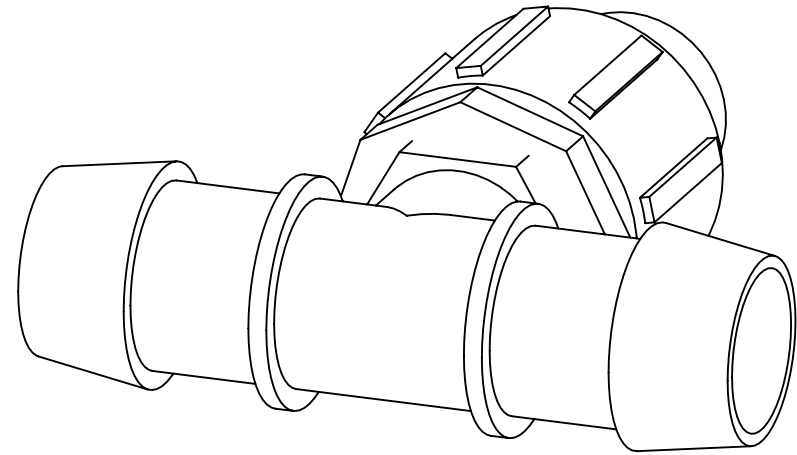


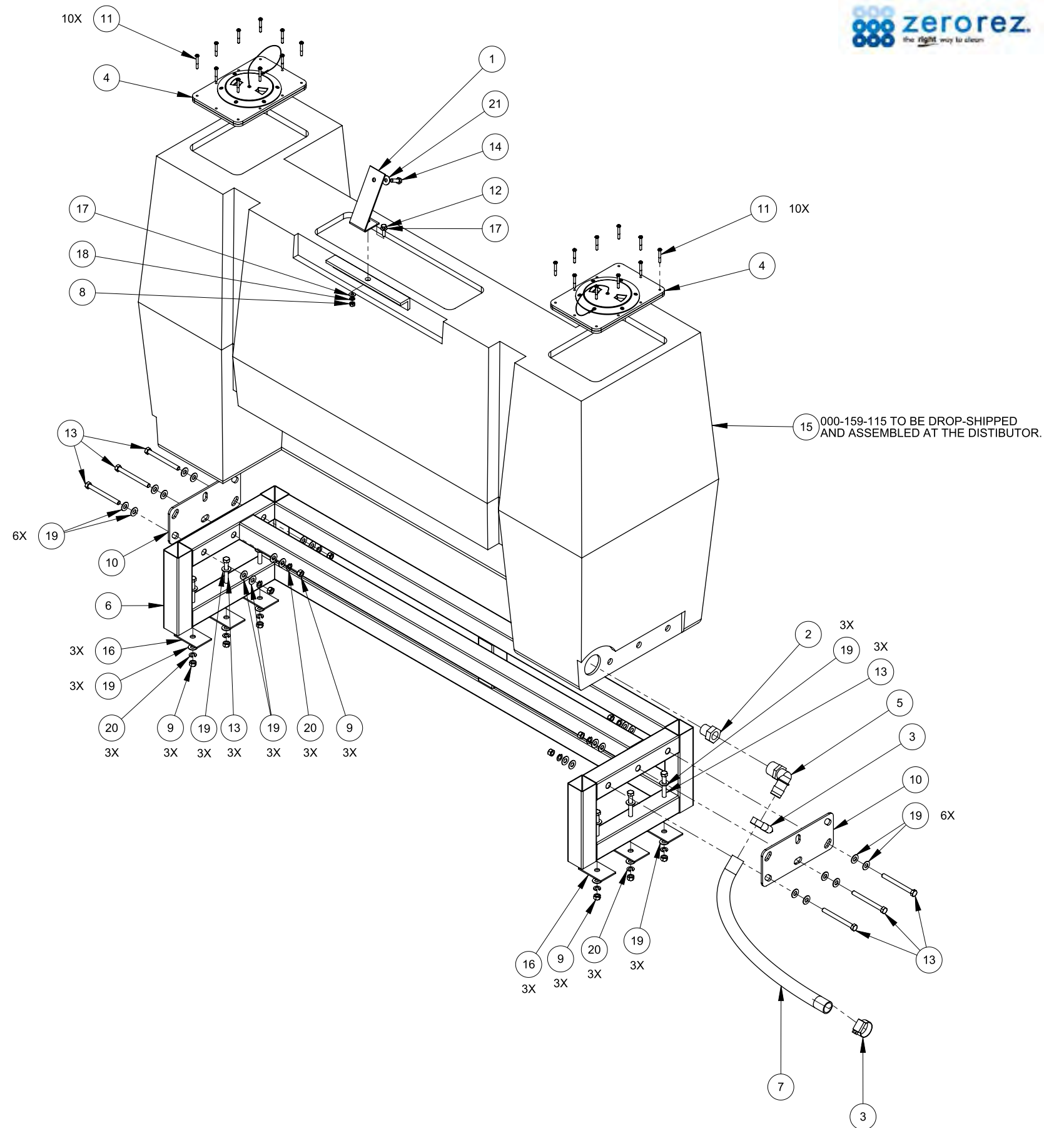
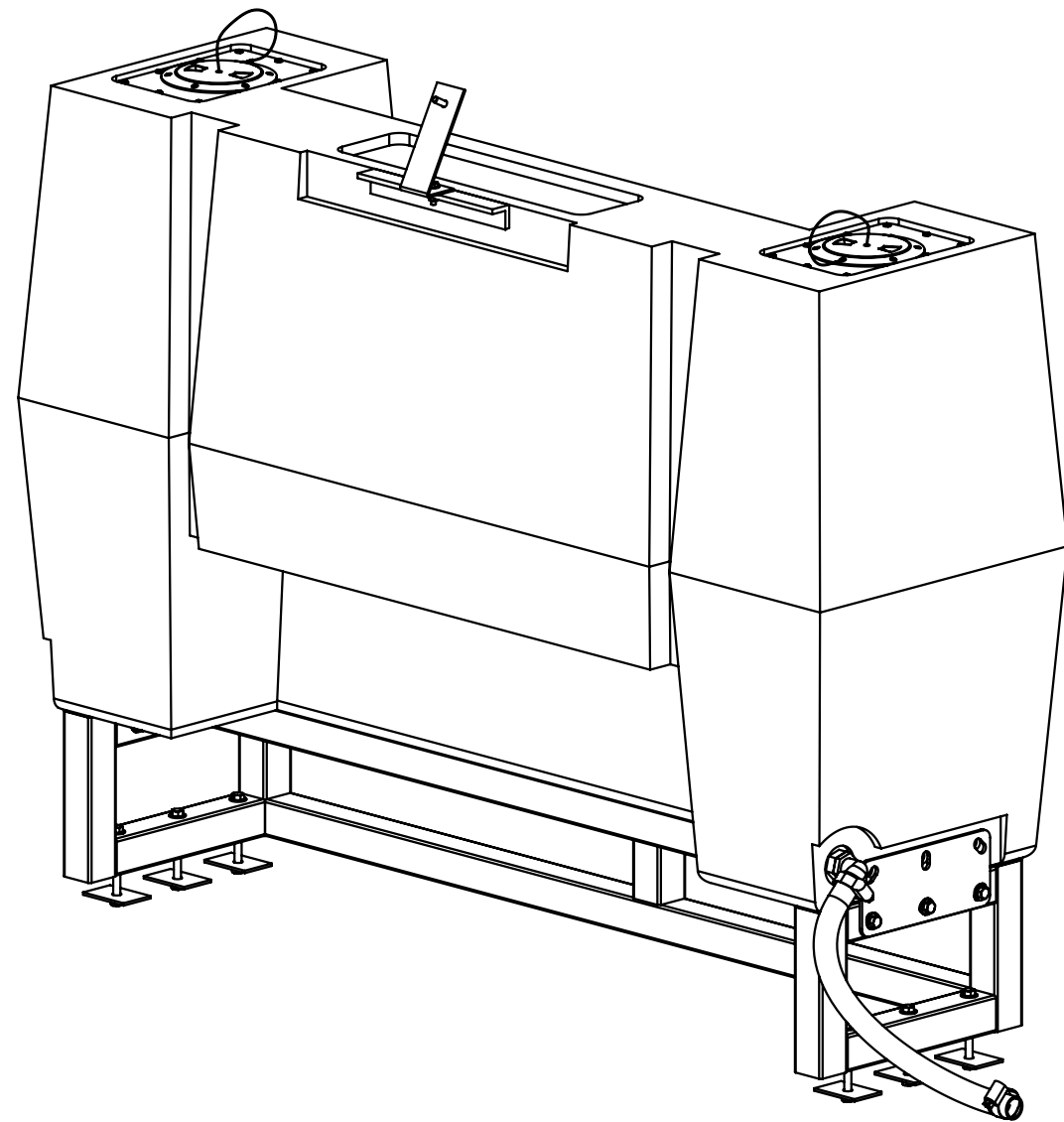
Figure 7-38. Tee Assembly
000-163-067 Rev. A



Tee Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-236	Adapter, 3/4" MPT X 1"Female	1
2	000-052-235	Bushing, 3/4" FPT X 1" Male	1
3	000-052-510	Tee, 1" Hose X 3/4" NPT	1

Figure 7-39. 110 Gallon Fresh Water Tank Assembly
000-159-119 Rev. B

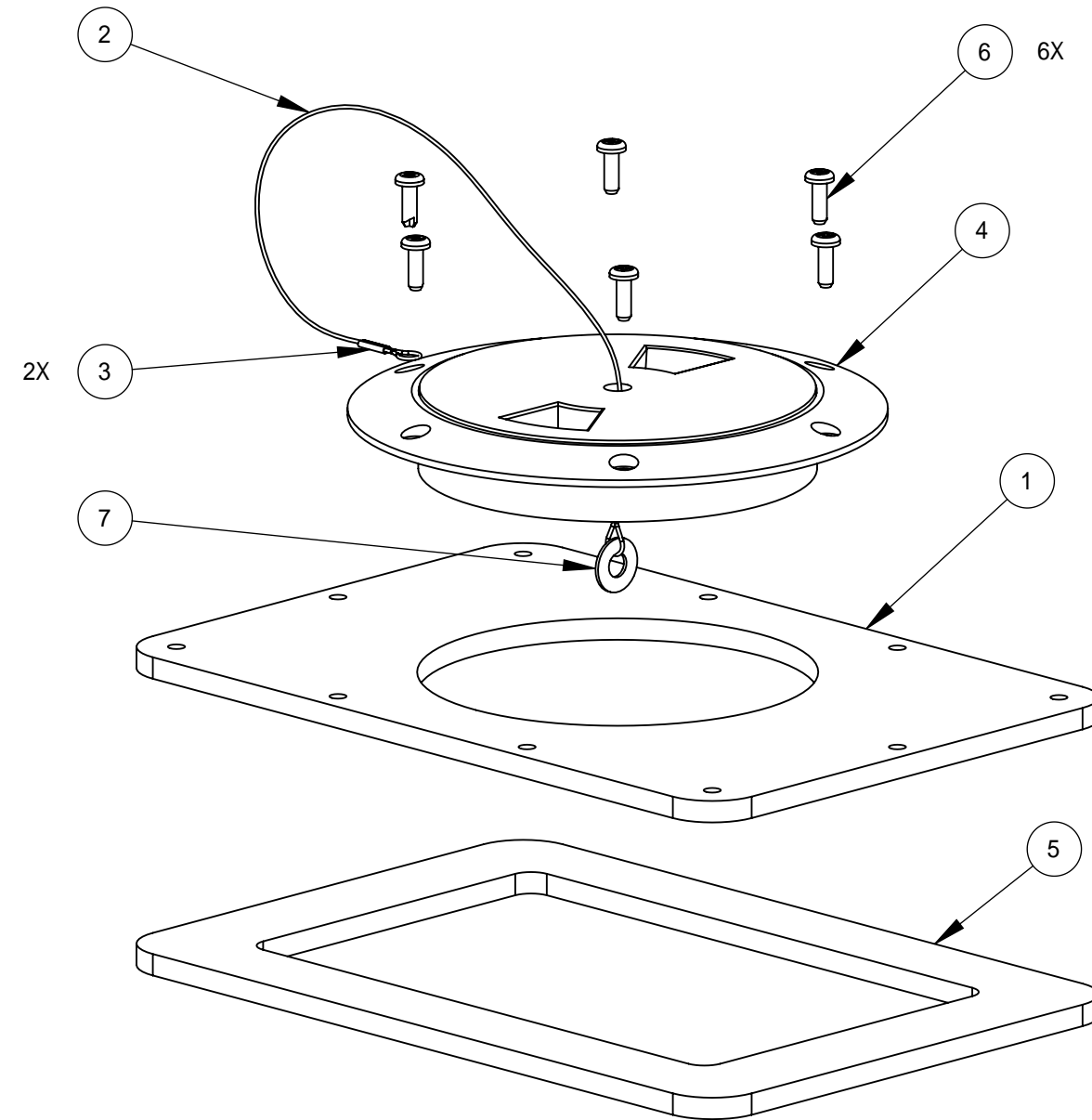
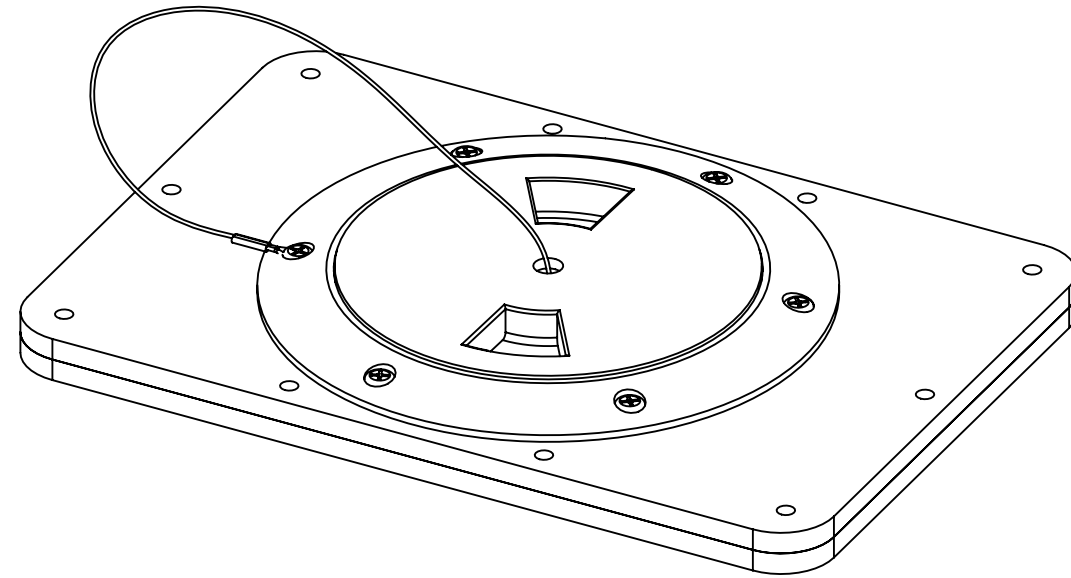


110 Gallon Fresh Water Tank Assembly Parts List

Item	Part Number	Description	Qty
1	000-015-206	Bracket, Poly Tank Support - Coated	1
2	000-052-186	Bushing, 1 1/2" NPT X 1"	1
3	000-033-020	Clamp, Size #16 Hose	2
4	000-041-020	Cover, 110G Lid Assembly	2
5	000-052-131	Elbow, 1"NPT X 1" Barb (Glass Filled Black Nylon)	1
6	000-055-001	Frame, Pumptec - Coated	1
7	000-068-250	Hose, 1" Green Stripe - 30" Long	1
8	000-094-010	Nut, 1/4"-20UNC Hex	1
9	000-094-101	Nut, 3/8"-16 UNC Hex Jam	12
10	000-105-237	Plate, Frame Attachment - Coated	2
11	000-143-537	Screw, #10 X 1.5" Lg. Pan Head Sheet Metal	20

Item	Part Number	Description	Qty
12	000-143-002	Screw, 1/4"-20UNC X 1.00" Lg. Hex Head	1
13	000-143-198	Screw, 3/8"-16UNC X 4" Lg. Hex Head - Full Thread	12
14	000-143-323	Screw, 5/16"-18UNC X 1" Lg. Hex Hed Tap	1
15	000-159-115	Tank, Poly Fresh Water	1
16	600-011-003	Tie Down Cleat Washer - Fabricated	6
17	000-174-003	Washer, 1/4" Flat	2
18	000-174-019	Washer, 1/4" Lock	1
19	000-174-032	Washer, 3/8" Flat	36
20	000-174-057	Washer, 3/8" Lock	12
21	000-174-004	Washer, 5/16" Flat	1

Figure 7-40. 110 Gallon Fresh Water Tank Lid Assembly
000-041-020 Rev. C



110 Gallon Fresh Water Tank Lid Assembly Parts List

Item	Part Number	Description	Qty
1	000-041-072	Bracket, Lid	1
2	000-025-008	Cable	1
3	000-033-032	Clamp, CDS Throttle Cable	2
4	000-041-365	Cover, 4" Round	1
5	000-057-001	Gasket, Lid	1
6	000-143-314	Screw, #8 X 1/2" Lg. Pan Head	6
7	000-174-003	Washer, 1/4" Flat	1

Figure 7-41. Three Tier Stainless Steel Shelf Assembly
000-163-038 Rev. B

Three Tier Stainless Steel Shelf Assembly Parts List

Item	Part Number	Description	Qty
1	000-166-057	Tray, Three Tier	3
2	000-083-020	Leg, Three Tier Shelf	2
3	600-011-003	Tie Down Cleat Washer - Fabricated	4
4	000-081-173	Label	1
5	000-174-019	Washer, 1/4" Lock	24
6	000-094-010	Nut, 1/4"-20UNC Hex	24
7	000-143-333	Screw, 1/4"-20UNC X 0.50" Lg. Hex Head	24
8	000-143-198	Screw, 3/8"-16UNC X 4" Lg. Hex Head - Full Thread	4
9	000-094-015	Nut, 3/8"-16UNC Hex 2-Way Locking	4
10	000-015-024	Bracket, Shelf Mounting	2

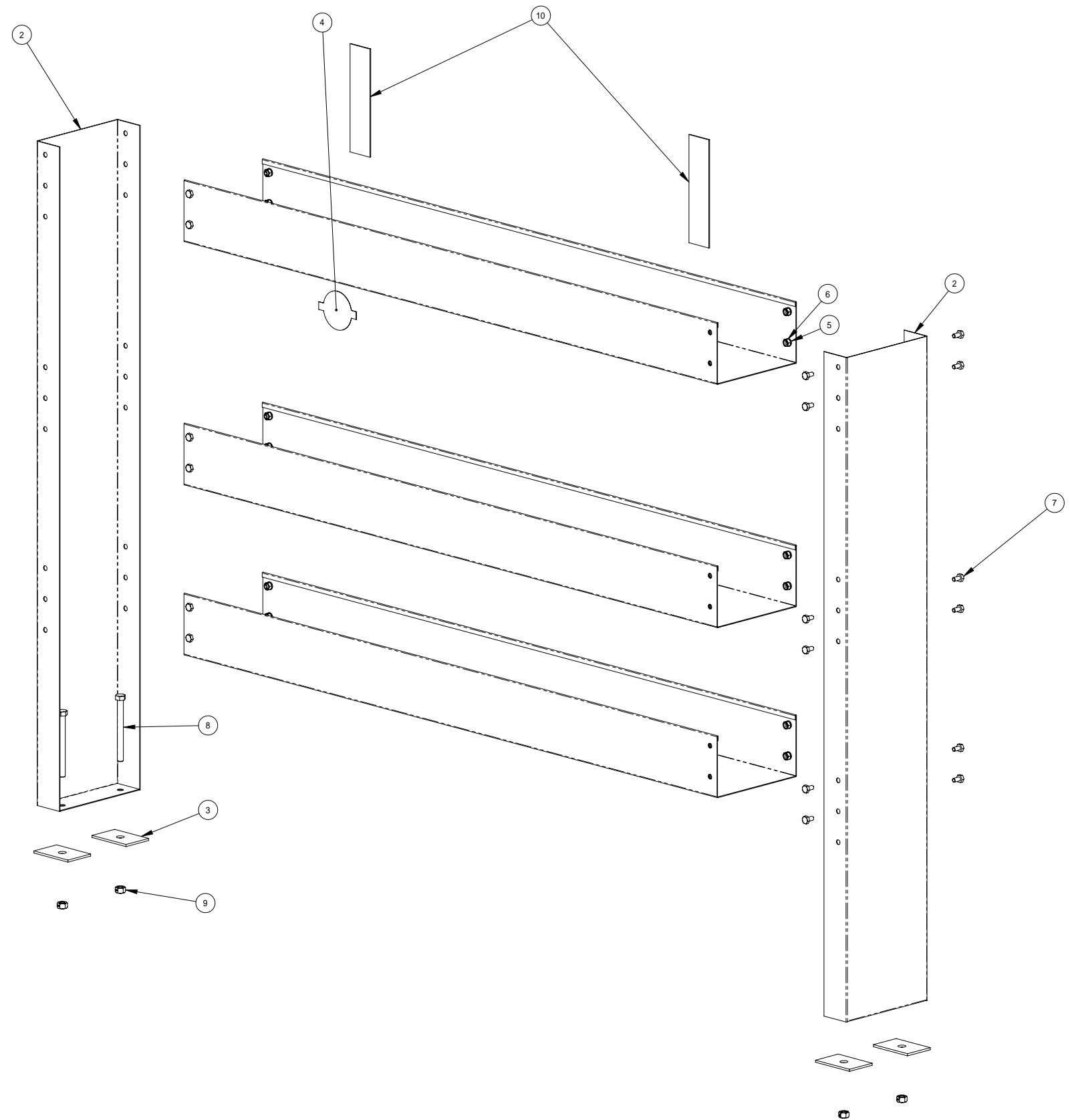


Figure 7-42. Back Door Shelf Assembly
000-163-050

Back Door Shelf Assembly Parts List

Item	Part Number	Description	Qty
1	000-081-173	Label	1
2	000-094-004	Nut, #10-24UNC Hex	12
3	000-143-132	Screw, #10-24UNC X 0.75" Lg. Hex Head	6
4	000-163-049	Shelf, Back Door - Coated	1
5	000-131-003	Trimlok, 1/8" X 3/4"	2 ft
6	000-174-001	Washer, #10 Flat	18
7	000-174-014	Washer, #10 Lock	12

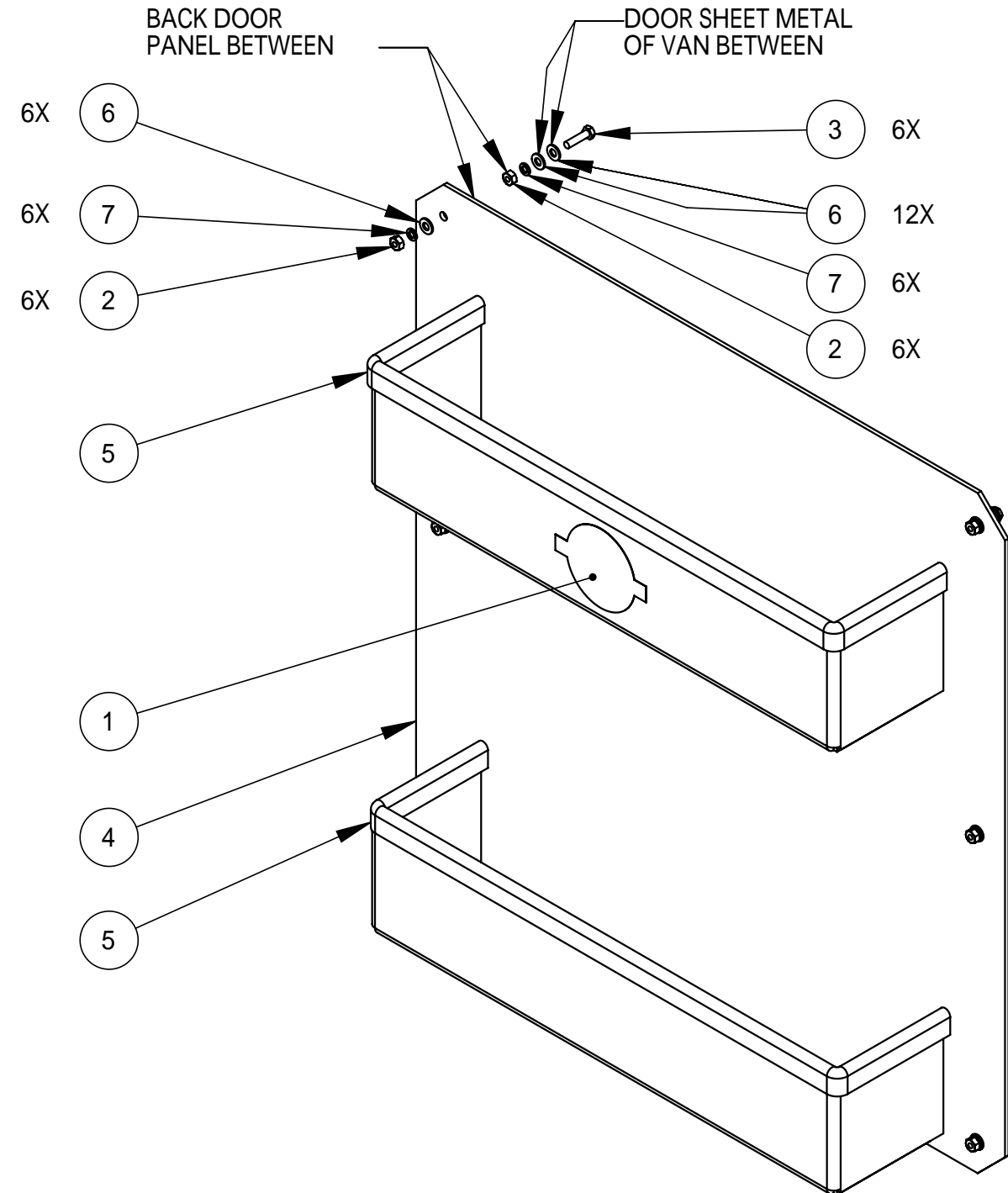
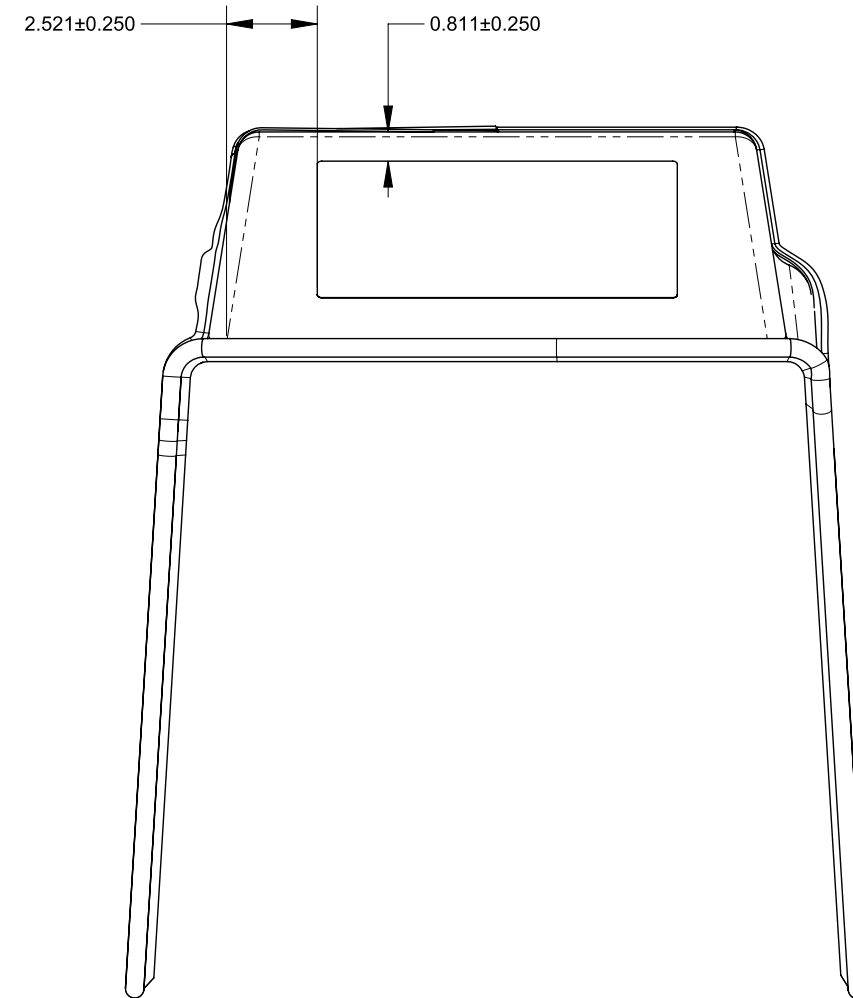
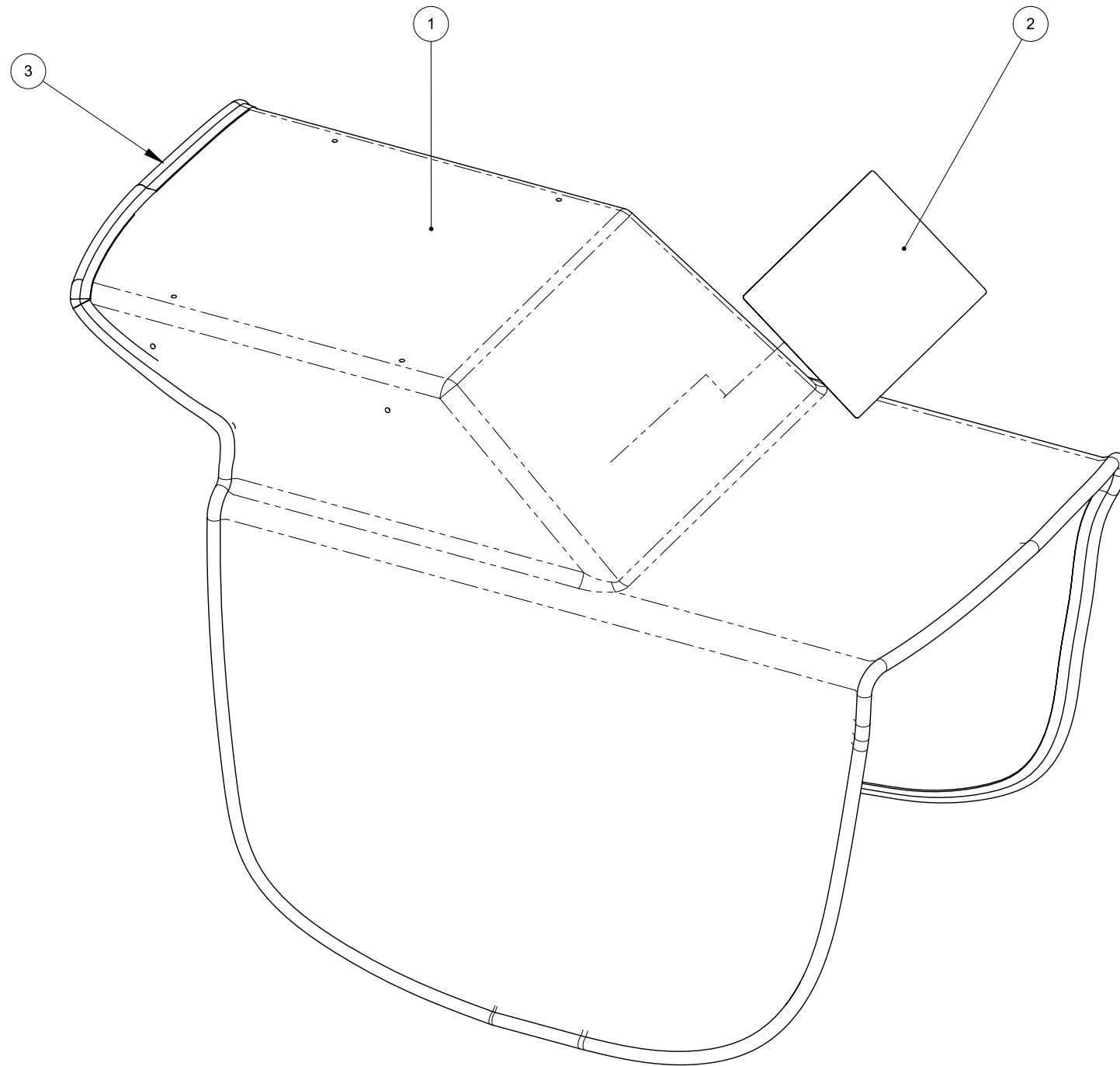


Figure 7-43. Cowling Assembly
601-020-008



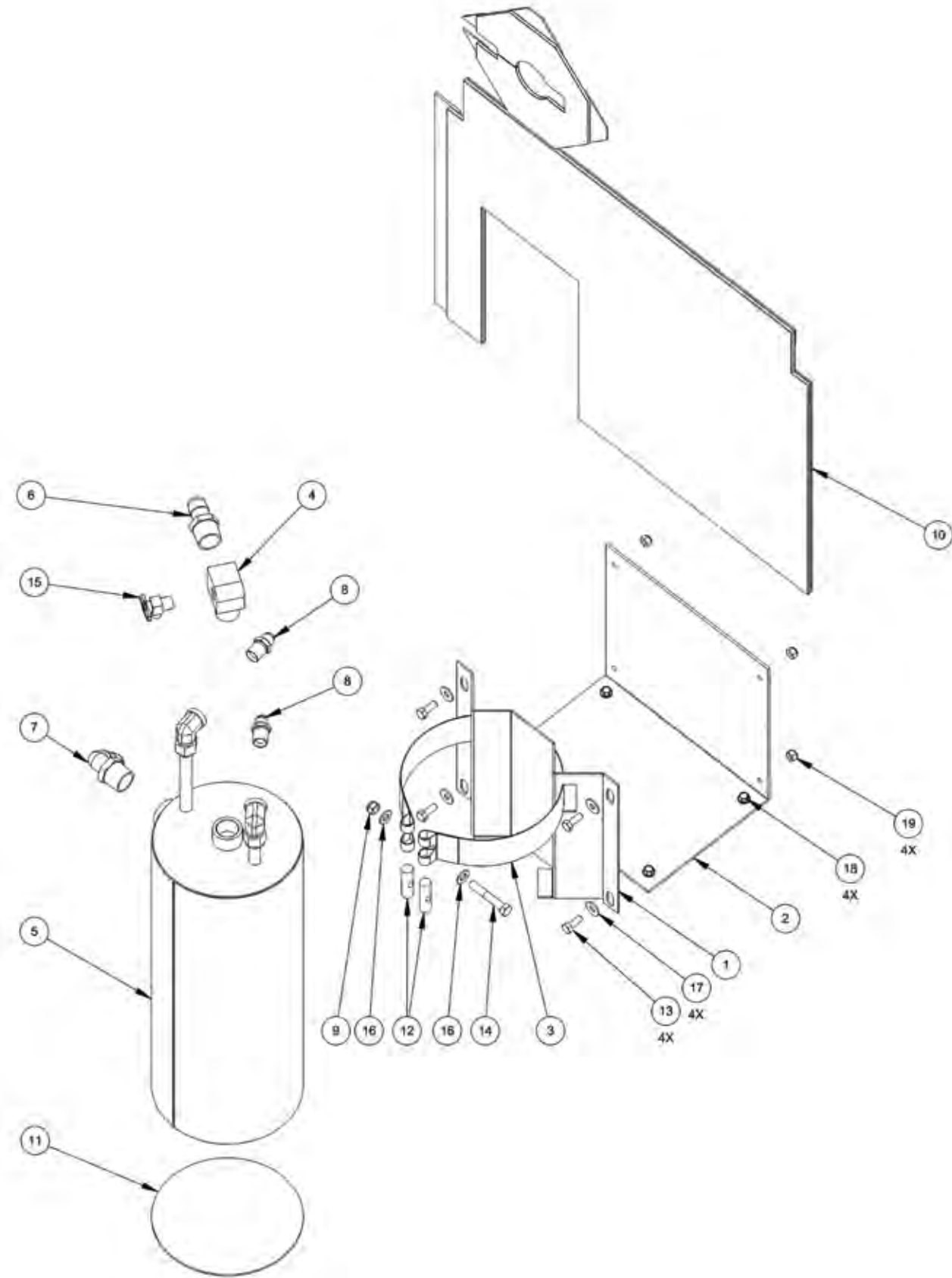
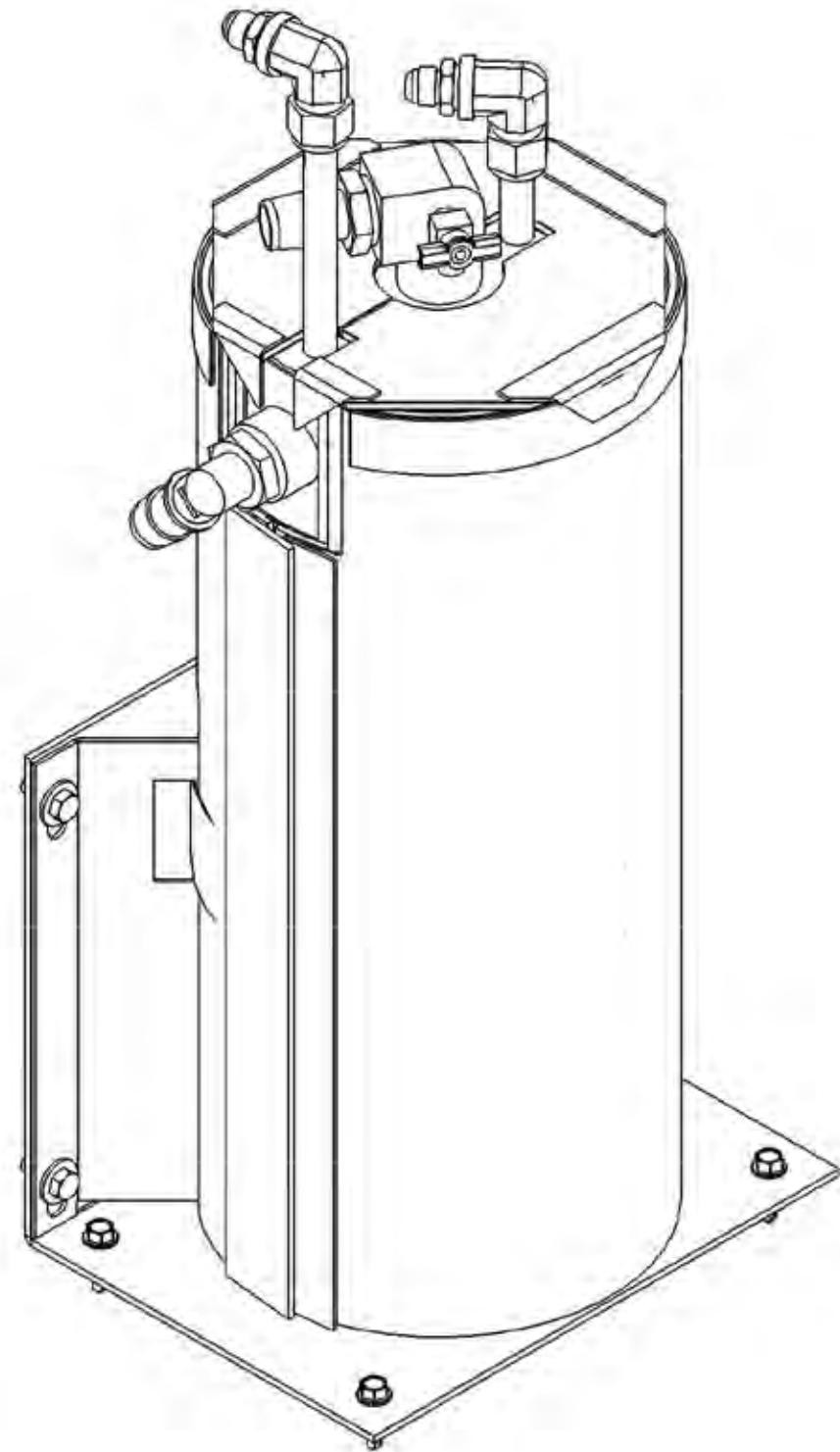
NOTICE

If the cowling is modified (cut to fit), it may be necessary to move the Driveline Lubrication Procedure and Specification Label to the side of the cowling (driver's side). Replacement labels are available by ordering this part number: 000-081-403.

Chevy Cowling Assembly Parts List

Item	Part Number	Description	Qty
1	000-041-139	Cowling, Chevy	1
2	000-081-403	Label, Driveline Lubrication Procedure and Specification	1
3	000-131-060	Trimlock, 3/4" Bulb	1 ft

Figure 7-44. 2nd Coolant Heat Exchanger Assembly
601-006-001 Rev. A



2nd Coolant Heat Exchanger Assembly Parts List

Item	Part Number	Description	Qty
1	000-015-745	Bracket, After Burner Mounting Saddle - Fabricated	1
2	000-015-971	Bracket, Coolant Heat Exchanger - Uncoated	1
3	000-033-123	Clamp, After Burner Mount - 21.125" Lg.	1
4	000-052-733	Fitting, 3/4" NPT Street Elbow - Modified	1
5	000-038-065	Heat Exchanger, Coolant - Weldment	1
6	000-052-338	Insert, #1212 (3/4" NPT X 3/4" Barb)	1
7	000-052-756	Insert, 3/4" NPT X 3/4" Elbow	1
8	000-052-507	Nipple, 3/8" NPT X 9/16"-18 37 Degree JIC S/S	2
9	000-094-038	Nut, 5/16"-18UNC Nylock	1
10	000-108-102	Protector, Coolant Heat Exchanger	1

Item	Part Number	Description	Qty
11	000-108-131	Protector, Heat Exchanger Pad Ø6.625	1
12	000-141-033	Rod, Heat Exchanger Strap Retainer - Fabricated	2
13	000-143-001	Screw, 1/4"-20UNC X 3/4" Lg. Hex Head	4
14	000-143-316	Screw, 5/16-18 X 2" HHCS	1
15	000-169-205	Valve, Petcock 90 Degree	1
16	000-174-049	Washer, 5/16" Flat	2
17	000-174-002	Washer, 1/4" Flat	4
18	000-143-712	Screw 1/4-20X 1" HXWSHD Self-Tapping	4
19	000-094-009	Nut, 1/4"-20UNC Nylock	4

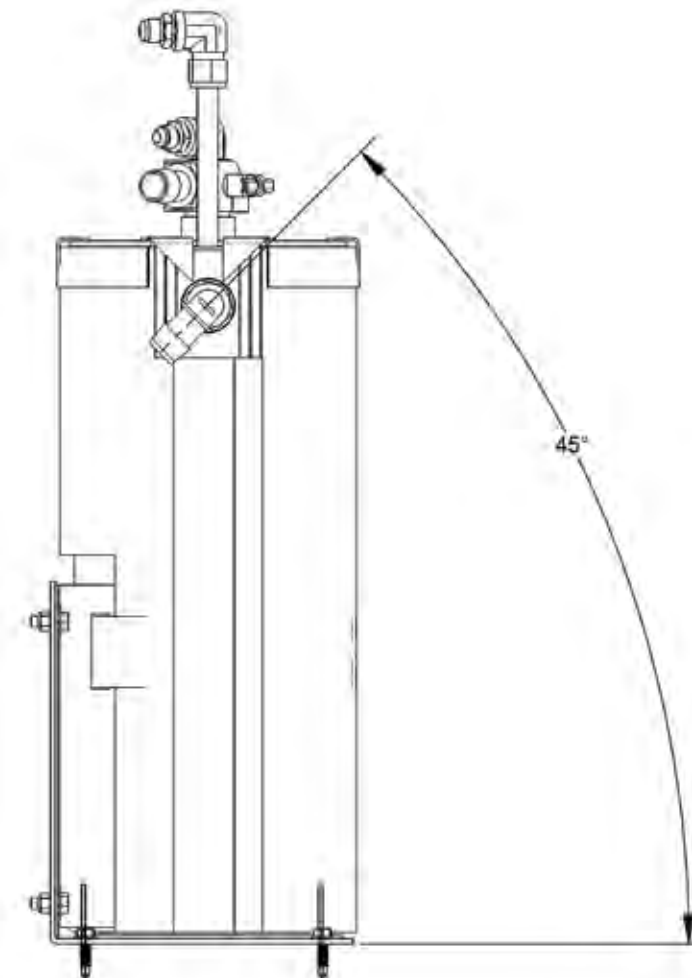
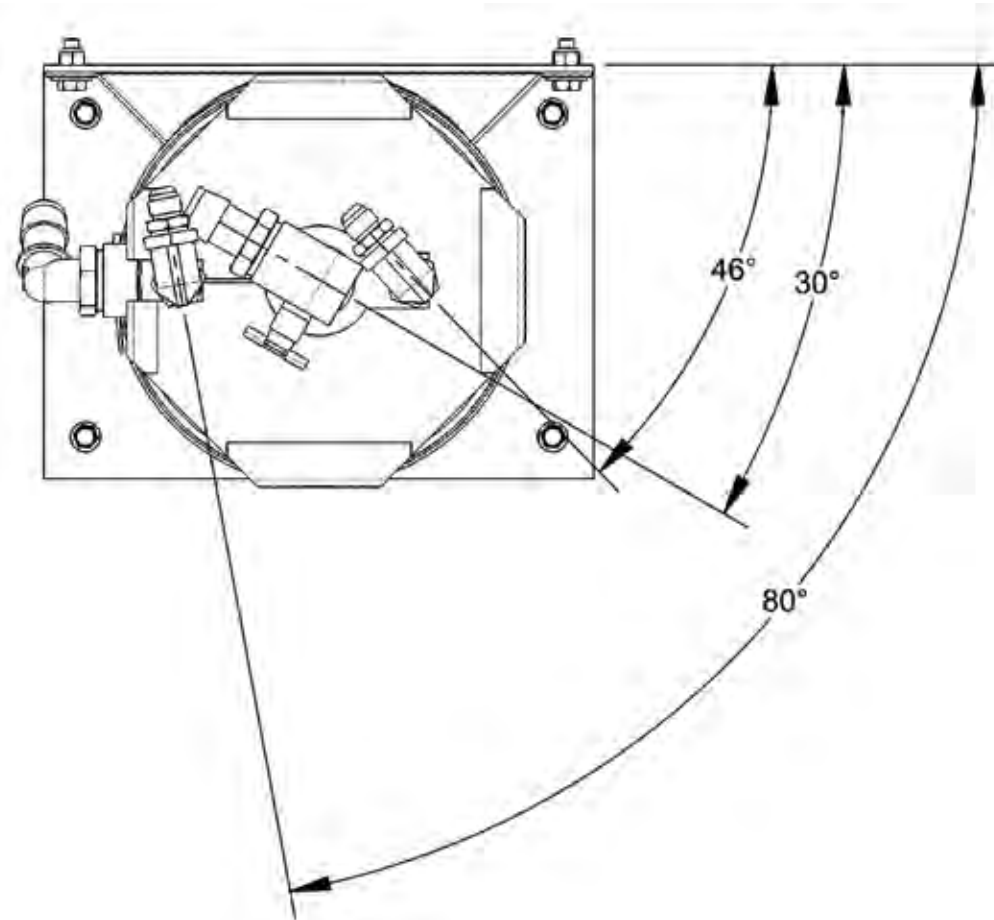
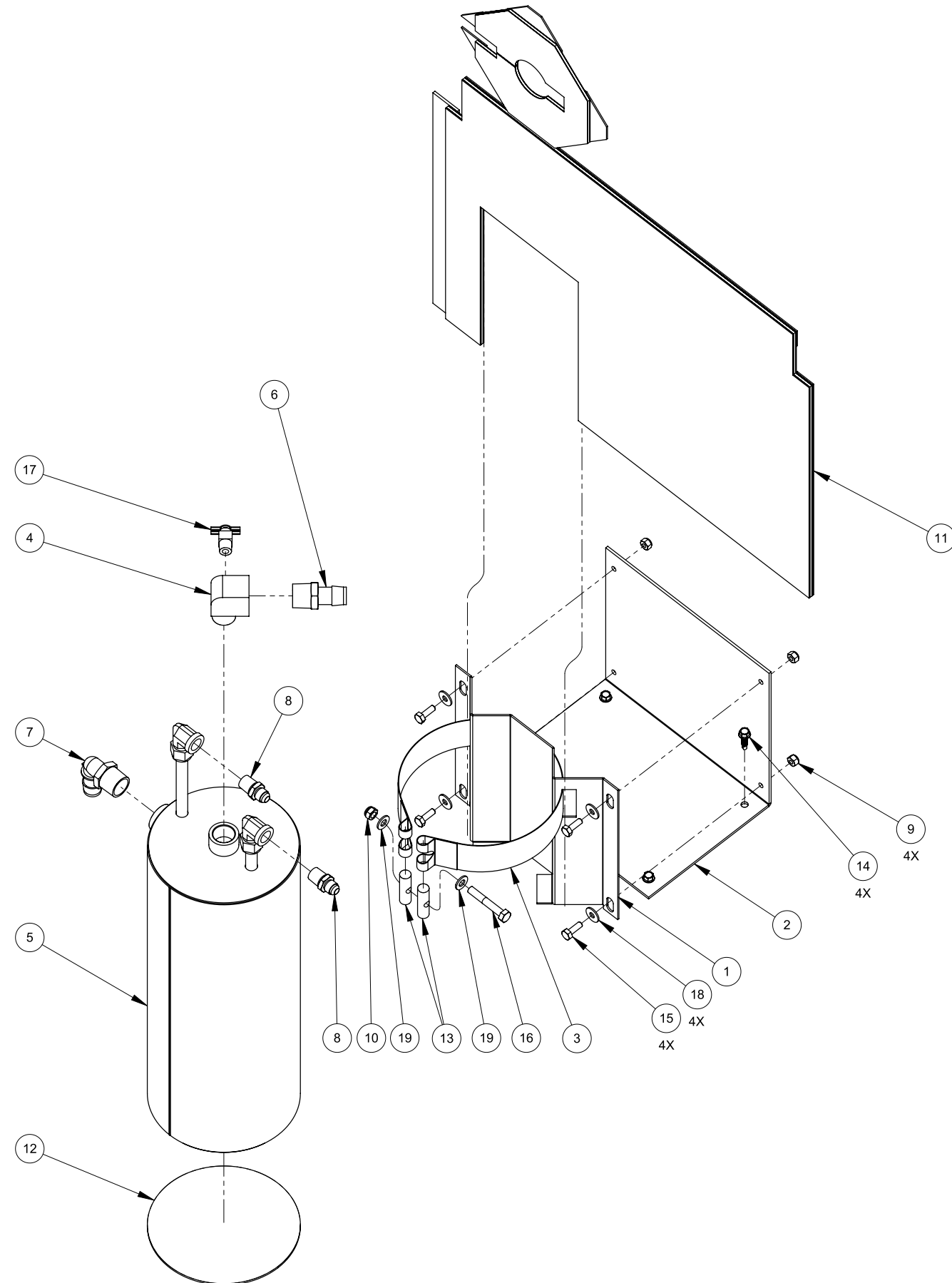
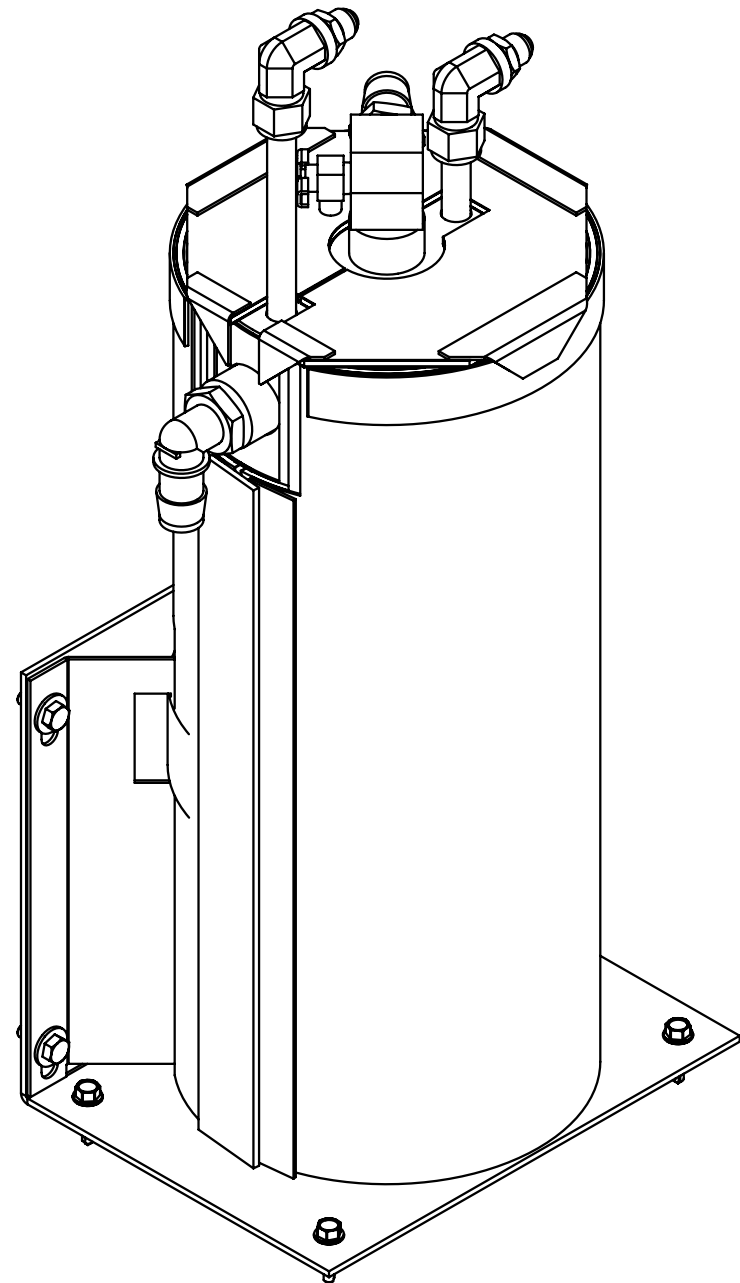


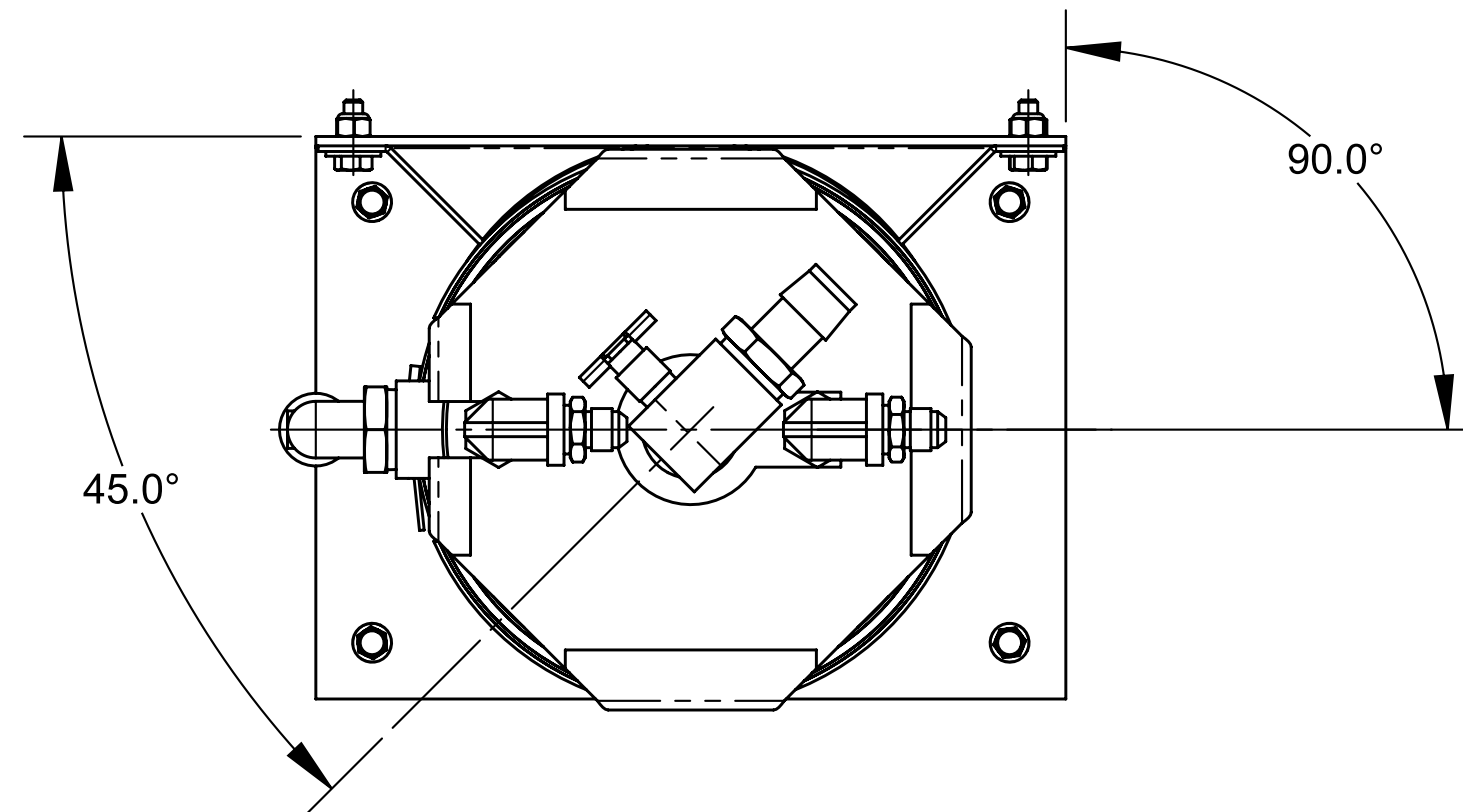
Figure 7-45. 3rd Coolant Heat Exchanger Assembly
601-006-002 Rev. A



3rd Coolant Heat Exchanger Assembly Parts List

Item	Part Number	Description	Qty
1	000-015-745	Bracket, After Burner Mounting Saddle - Fabricated	1
2	000-015-971	Bracket, Coolant Heat Exchanger - Uncoated	1
3	000-033-123	Clamp, After Burner Mount - 21.125" Lg.	1
4	000-052-733	Fitting, 3/4" NPT Street Elbow - Modified	1
5	000-038-065	Heat Exchanger, Coolant - Weldment	1
6	000-052-338	Insert, #1212 (3/4" NPT X 3/4" Barb)	1
7	000-052-756	Insert, 3/4" NPT X 3/4" Elbow	1
8	000-052-507	Nipple, 3/8" NPT X 9/16"-18 37 Degree JIC S/S	2
9	000-094-009	Nut, 1/4"-20UNC Nylock	4
10	000-094-038	Nut, 5/16"-18UNC Nylock	1

Item	Part Number	Description	Qty
11	000-108-102	Protector, Coolant Heat Exchanger	1
12	000-108-131	Protector, Heat Exchanger Pad Ø6.625	1
13	000-141-033	Rod, Heat Exchanger Strap Retainer - Fabricated	2
14	000-143-712	Screw 1/4-20X 1" HXWSHD Self-Tapping	4
15	000-143-001	Screw, 1/4"-20UNC X 3/4" Lg. Hex Head	4
16	000-143-316	Screw, 5/16-18 X 2" HHCS	1
17	000-169-205	Valve, Petcock 90 Degree	1
18	000-174-002	Washer, 1/4" Flat	4
19	000-174-049	Washer, 5/16" Flat	2



Hose Routings List

Part Number	Description	From	To
000-068-878	Hose, 1/2" Rubber - 8 ft Long	Back of HydraCradle	Pressure Regulator
000-068-644	Hose, 3/8"X 49 1/2" Teflon w/JIC Ends	Water Pump	Coolant Heat Exchanger
000-068-459	Hose, 3/4" I.D. Green Stripe Bulk	Coolant Heat Exchanger	Engine Water Pump Hose
000-068-802	Hose, 3/8" X 42" Teflon w/JIC Ends	Pressure Regulator	Salsa Heat Exchanger
000-068-802	Hose, 3/8" X 42" Teflon w/JIC Ends	Coolant Heat Exchanger	Salsa Heat Exchanger
000-068-754	Hose, Blower-Recovery Tank 4.8 - 3" Reinforced	Blower	Recovery Tank
000-068-528	Hose, 1" Red 200 psi	APO	Recovery Tank
000-068-069	Hose,3/4" Parker Gst li	APO	Bottom of Instrument Panel
000-068-763	Hose, 1" X 83" Lg Suction	Water Pump	Front of HydraCradle
000-068-459	Hose, 3/4" I.D. Green Stripe Bulk	Bottom of Instrument Panel	Radiator
000-068-644	Hose, 3/8"X 49 1/2" Teflon w/JIC Ends	Water Pump	Pressure Regulator
000-068-254	Hose,1/4" X 8 ft Blue w/ 1/4" Inserts Each	HydraCradle	Front of Instrument Panel
000-068-250	Hose, 1" Green Stripe Bulk	110 Gallon Water Tank	HydraCradle
000-068-459	Hose, 3/4" I.D. Green Stripe Bulk	Coolant Heat Exchanger	Bottom of Instrument Panel

8 - Maintenance and Troubleshooting

To avoid costly repairs and down-time, it is imperative to develop and practice good maintenance procedures from the beginning. These procedures fall into daily, weekly, monthly and quarterly increments, and are outlined in this section. All recommended maintenance on the Zerorez CDS must be performed by competent service personnel.

This section includes:

- Zerorez CDS 4.8 Maintenance and Troubleshooting
 - Operational Maintenance
 - Appearance Maintenance
 - Drive Shaft Maintenance
 - Troubleshooting

- HydraCradle Maintenance and Troubleshooting
 - Operational Maintenance
 - Appearance Maintenance
 - Troubleshooting

NOTICE

Important: Record the date and machine hours on the maintenance log. Maintenance logs are provided for your convenience in the Owner's Guide. Records of maintenance must be kept and copies may be required to be furnished to HydraMaster before the warranty is honored. It is recommended that you affix a copy of the log on the vehicle door near your unit for convenience and to serve as a maintenance reminder.

ZEROREZ CDS 4.8 MAINTENANCE AND TROUBLESHOOTING

Operational Maintenance

This section contains recommendations for maintenance that will affect the service life of your unit.

CAUTION

HydraMaster recommends that you follow the vehicle maintenance schedule as stated by the manufacturer. All HydraMaster references to vehicle maintenance serve as general vehicle service reminders. If there are any questions regarding servicing of your vehicle, please contact your local vehicle dealership.

Daily

- Check engine oil level.
- Empty recovery tank inlet filter.
- Visually inspect machine for loose wires, oil leaks, water leaks, etc.
- Inspect recovery tank stainless steel filter for clogging or damage. Clean, repair or replace as needed.
- Inspect and clean the vacuum slot on the cleaning wand. Watch for sharp edges that may tear the carpet, remove any sharp edges as required.
- Lubricate blower with an oil-based lubricant through blower inlet.
- Perform freeze guard procedure as weather dictates

Weekly

- Check around vehicle and CDS unit for any evidence of oil/fluid leaks.

▲ WARNING

Grease, oil, antifreeze, and debris build-up near hot equipment, such as the vehicle engine exhaust system or the CDS blower exhaust system, can present a fire hazard and can cause death or bodily injury.

Vehicle engine exhaust system or the CDS blower exhaust system, can present a fire hazard and can cause death or bodily injury.

- Change pump oil after first 50 hours; every 300 hours thereafter.
- Check pump oil. Add as necessary.
- Check pump drive belts for wear. Check HydraCradle belt also.
- Check pump pulleys for wear.
- Lubricate zerk on HydraCradle swivel every 40 hours with moly grease.
- Check internal machine high pressure water lines for wear or chafing.

- Remove the stainless steel blower inlet filter inside the recovery tank and thoroughly clean, removing all lint build-up. Inspect for damage and re-install.
- Inspect vacuum relief valve. Clean and lubricate as necessary.
- Inspect all external solution hoses, vacuum hoses, and quick connects for wear or damage that may cause premature failure, replace as needed.
- Clean recovery tank thoroughly with high pressure washer.
- Check magnesium anodes in recovery tank and replace as necessary
- Check vehicle engine rpm on CDS tachometer:
 - Speed 1 = 1,500
 - Speed 2 = 1,400
 - Speed 3 = 1,300

Monthly

- Change engine oil.
- Change blower oil after first 100 hours of use.
- Check engine air cleaner filter. Clean as necessary.
- Clean battery connections as needed.
- Change blower oil after first 100 hours.
- Grease drive shaft U-joints (Drive Shaft Maintenance, Figure 8-1). Inspect for wear.

Quarterly

- Change oil in blower.
- Change oil in pump every 300 hours.
- Check the vehicle fuel lines for any chafing or wear, especially in the engine compartment or near any rotating parts.
- Check the CDS wiring harness for any chafing or wear, especially in the vehicle engine compartment or near any rotating parts.
- Check the vehicle wiring harness for any chafing or wear, especially in the vehicle engine compartment or near any rotating parts.
- Check CDS blower mounting fasteners, drive shaft clamping collar fasteners, and
- CDS front end component fasteners, tighten as needed.
- Grease the drive shaft spline if so equipped.
- Grease the power pack pillow block bearings.

Yearly

- Give truck complete vehicle service.
- Flush the truck's cooling system. Add new anti-freeze.
- Change the truck's transmission fluid.
- Grease drive shaft U-joints and splines.
- Clean and inspect Salsa heat exchanger.

Appearance Maintenance

Maintaining the original appearance of your unit is important for two reasons:

1. It represents a big dollar investment for your cleaning business and its appearance should reflect that fact. A dirty machine does not look professional.
2. Maintenance, troubleshooting and repair is much easier to accomplish on a clean, well-maintained unit. Regular cleaning of the machine offers you an opportunity to visually inspect all parts of the machine and spot potential problems before they occur.

The following maintenance is recommended by the manufacturer at the frequency indicated:

Daily

- Wipe machine down thoroughly with a damp cloth.
- Flush recovery tank out thoroughly.
- Clean wand to maintain original appearance.
- Wipe down vacuum and high pressure hoses as needed.
- Visually inspect hoses for cuts, etc.

Weekly

- Wipe down entire unit as needed.
- Apply good coat of auto wax to all painted surfaces inside and out.
- Thoroughly clean wand and inspect for clogged jet, debris in vacuum slot and leaking fittings at valve.
- Apply light coat of auto wax to wand. Thoroughly clean vacuum and high pressure hose including hose cuffs.

Drive Shaft Maintenance

Every 500 operating hours, apply lubricant to the drive shaft's zerk fittings at clutch and blower flange U-joints (see Figure 8-1).

The drive shaft splines should also be lubricated with a bearing grease with an application temperature range of -4° F to +347° F; the drive shaft manufacturer recommends Mobil Delvac Xtreme Service™ grease as the lubricant.

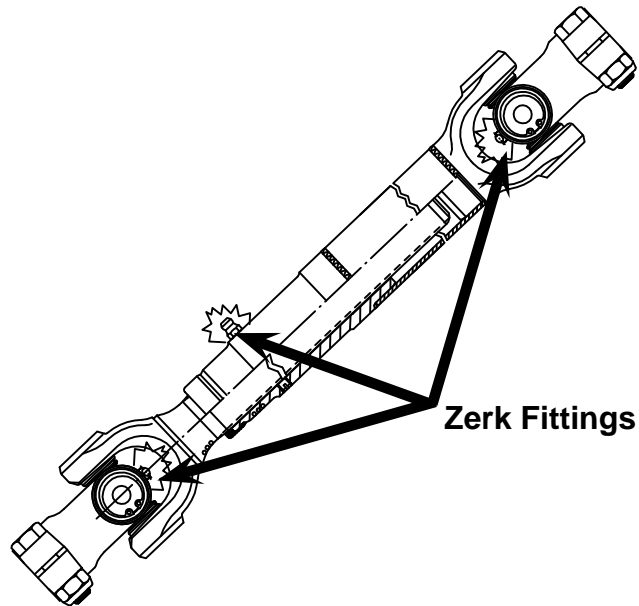


Figure 8-1. Zerk Fittings on Drive Shaft

NOTICE

HydraMaster flexible drive shaft assemblies have two universal joints, one on either end of the drive shaft. The previously mentioned lubrication interval refers to both universal joints.

TROUBLESHOOTING

Heating System

1.0. Vehicle overheats and shuts off CDS

Refer to vehicle dealer for diagnosis and repair.

2.0. Vehicle overheats

	Probable Cause	Solution
2.1.	Faulty thermostat in vehicle.	Refer to dealer
2.2.	Faulty water pump on vehicle	Refer to dealer
2.3.	Faulty radiator (plugged) limited water flow	Refer to dealer
2.4.	Faulty fan clutch, limited air-flow.	Refer to dealer

3.0. Unable to achieve normal cleaning temperature

	Probable Cause	Solution
3.1.	There is hard water or build-up in the heat exchangers.	This will not allow the heat to transfer properly. Flush as necessary.
3.2.	Flow is too great.	Measure flow at tool.
		The jet in the cleaning tool is too large or worn out. Test the tool for water flow and replace or repair jet as necessary.
		Pressure is too high. Adjust pressure to normal. Inspect pressure gauge for accurate reading.
3.3.	The CDS is being operated at too low rpm or too low vacuum setting.	The system must be at full operating rpm and full vacuum load to achieve full operating temperature. These values must be set per manufacture's specifications. Adjust vacuum or rpm as necessary.

4.0. System attains normal heat but drops off sharply

	Probable Cause	Solution
4.1.	Flow at cleaning tool is too high.	Orifice in tool is too large or worn out. Test flow of tool. Repair or replace as necessary.
4.2.	The rpm of machine is set too low.	Adjust as necessary.
4.3.	Pressure is too high.	Adjust pressure to normal. Inspect pressure gauge for accurate reading.

Miscellaneous**1.0. Vehicle radiator overflows into coolant overflow container while machine is in use**

	Probable Cause	Solution
1.1.	Internal leak in coolant heat exchanger.	Pressure test each heat exchanger separately to determine which heat exchanger is faulty. This process requires heated water and high pressure to simulate the same conditions that are causing the leak. Refer to qualified service technician if necessary.

HYDRACRADLE MAINTENANCE AND TROUBLESHOOTING

This section is divided into the following topics:

- Operational Maintenance
- Appearance Maintenance

Operational Maintenance

This section contains recommendations for maintenance that will affect the service life of your HydraCradle. HydraMaster recommends that you follow maintenance schedules as stated.

Belt Tension

Each month, check the tension on the V belt by:

1. Removing power from the HydraCradle by detaching the HydraCradle's battery cables from the 12 V battery.
2. Removing the screws and washers that secure the belt cover to the HydraCradle frame and then remove the belt cover.
3. Pressing in on the V belt to test the tension. If the belt can be pressed in more than 1" - 1 1/2", it needs to be tightened.
4. After checking and/or adjusting the belt, re-attach the belt cover frame and re-apply power.

Zerk Lubrication

Lubricate the zerk on the swivel after every 40 hours of use with molybdenum disulfide ("moly") grease (see Figure 8-2).

CAUTION

Do not overgrease.



Figure 8-2. Location of Zerk on Swivel

Appearance Maintenance

Maintaining the original appearance of your HydraCradle is important for two reasons:

1. It represents a big dollar investment for your cleaning business and its appearance should reflect that fact. A dirty machine does not look professional.
2. Maintenance, troubleshooting and repair is much easier to accomplish on a clean, well-maintained unit. Regular cleaning of the tank offers you an opportunity to visually inspect all parts of the tank and spot potential problems before they occur.

The following maintenance is recommended at the frequency indicated:

Daily

- Wipe tank thoroughly with a damp cloth.
- Wipe down hoses as needed.

Weekly

- Visually inspect hoses for cuts and abrasions.
- Thoroughly clean hoses.
- Remove large debris which may have accumulated under the vacuum hose, at the bottom of the tank, and wipe away any remaining smaller debris.

TROUBLESHOOTING

1.0. No vacuum hose retraction - foot switch will not power on

Possible Cause	Solution
1.1 Check foot switch	Connections are not secure; reseal connectors.
	Check continuity on foot switch cables; if defective, replace foot switch.
1.2. Check hose reel motor	30 Amp fuse is bad; replace fuse.
	Drive belt is loose or broken; adjust or replace belt.
1.3. Check battery	Battery is weak or dead; replace battery.
	Battery connections are not tight; reseal connectors
	Check continuity on battery cables; if defective, repair or replace.

2.0. Recovery hose vacuum is weak or there is no vacuum

Possible Cause	Solution
2.1. Recovery hose is not securely connected to mount.	Disconnect and reconnect the recovery hose onto the barbed fitting.
2.2. Square head plug on mount is missing or is not seated tightly.	Insert and tighten plug onto one opening of the mount.
2.3. Mount O-rings may be defective.	Disassemble mount and check the 3 O-rings; replace all 3 O-rings as necessary. <u>Always</u> lubricate the O-rings with standard O-ring grease prior to re-installation.

3.0. Solution hose losing pressure or has no pressure

Possible Cause	Solution
3.1 Quick connects may have come loose.	Tighten or replace as necessary.
3.2 Hoses may be leaking.	Repair or replace as necessary.

4.0. HydraCradle Tank is empty or fills slowly

Possible Cause	Solution
4.1. No water coming from source.	Check water supply.
4.2 There is a restriction in the water supply system.	Inspect hose connections between fresh water tanks. Tighten if necessary.

5.0. HydraCradle Tank overflows or will not fill all the way

Possible Cause	Solution
5.1. There is a restriction in the air vent, extending from the HydraCradle Tank.	Inspect and clean, or repair as necessary.

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9 - How to Order Parts

To order warranty replacement parts or repairs, it is important that you read this section which includes:

- Warranty Parts Orders
- Parts Orders
- Emergencies
- One Final Note

WARRANTY PARTS ORDERS

1. Call the local distributor where you purchased your equipment and ask for the Service Department.
2. Have the following information ready:
 - a. Equipment Model
 - b. Date of Purchase
 - c. Hours on the Unit
 - d. Unit Serial Number
 - e. Description of Malfunction
3. Once it has been determined which parts are needed to correct the problem with your machine, make arrangements with your distributor to either perform the repairs or ship the parts to you.

Any questions you have regarding the warranty program should be directed to the Customer Service Department at (425) 775-7275, 7 a.m. to 5 p.m. Monday through Friday (Pacific Time).

We shall always endeavor to be fair in our evaluation of your warranty claim and shall provide you with a complete analysis of our findings.

HydraMaster warranty covers only defective materials and/or workmanship for the periods listed. Diagnostic reimbursement is specifically excluded.

PARTS ORDERS

Call your local distributor. In most instances, they either stock or have access to parts through a regional service center.

EMERGENCIES

If, for any reason, your distributor is unable to supply you with the necessary parts, they may call us and arrange for expedited shipping.

HydraMaster sells parts only through authorized distributors and service centers.

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10 - Warranty Information

To avoid misunderstandings which might occur between machine owners and the manufacturer, we are listing causes of component failure that specifically voids warranty coverage. Such causes listed in this section shall constitute abuse or neglect.

ZEROREZ CDS 4.8

Blower

- Failure to lubricate impellers daily with an oil-based lubricant, to lubricate bearings, to maintain proper oil levels, or to use the correct oil grade and viscosity as recommended in blower manual.
- Failure to properly maintain blower safeguard systems such as waste tank filter screen, vacuum safety relief valve and waste tank automatic shut-off system.

High Pressure Water Pump

- Failure to maintain proper oil level as recommended in pump manual.
- Failure to change oil in pump at recommended intervals.
- Failure to protect pump against freezing.
- Failure to maintain pump protection shut-off system.
- Failure to protect against freezing.

Recovery Tank

- Failure to properly maintain filtering devices in tank.
- Failure to clean tank as recommended by manufacturer.
- Failure to maintain vacuum safety release in tank.

Control Panel

- Failure to protect water pressure gauge against freezing.

Vacuum and Solution Hoses

- Failure to protect hoses against freezing.
- Failure to protect hoses against burns from engine and blower exhaust.
- Damage to hoses from being run over by vehicles.
- Kinking or cracking from failure to store or unroll hoses correctly.
- Normal wear and tear from everyday use.

Cleaning Wand and Tool

- Failure to protect against freezing.
- Obvious physical abuse of wand or tool.

Water Heating System

- Over-pressurization of the system (recommended maximum working pressure - 1,200 psi).
- Failure to protect against freezing.

Warranty Procedure

Warranty coverage for the CDS 4.8 system and cleaning wand/tool is available to you through your local distributor.

For Your Reference:

Serial No. _____

Date of Purchase: _____

Purchased From (Distributor): _____

HYDRACRADLE TANK

The warranty on the tank portion, itself, is 3 years; the warranty for all other parts is 1 year.

Vacuum and Solution Hoses

- Failure to protect hoses against freezing.
- Failure to protect hoses against burns from engine and blower exhaust.
- Damage to hoses from being run over by vehicles.
- Kinking or cracking from failure to store or unroll hoses correctly.
- Normal wear and tear from everyday use.

Warranty Procedure

The standard warranty on the HydraCradle Tank is 1 year on all parts, 2 years on the blower and 90 days on the labor.

When contacting your distributor, be sure to have the machine's information, including serial number, ready for the service representative.

For Your Reference::

Serial No. _____

Date of Purchase: _____

Purchased From (Distributor): _____